

Stockton Street Enhancement Project

Prepared for:
Chinatown Community Development Center
and
The City and County of San Francisco
Department of Parking and Traffic

Prepared by:



CHS Consulting
Group

500 Sutter Street, Suite 216
San Francisco, CA 94102
(415) 392-9688

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EXECUTIVE SUMMARY

The Stockton Street Enhancement Project, funded by a grant from the Metropolitan Transportation Commission's (MTC) Transportation for Livable Communities (TLC) program, is jointly managed by the Chinatown Community Development Center (CCDC) and the San Francisco Department of Parking and Traffic (DPT). The purpose of the Stockton Street Enhancement project is to develop pedestrian and transit enhancements along Stockton Street in Chinatown from Broadway to the northern end of the Stockton Street Tunnel.

This report analyzes and recommends various changes and improvements to Stockton Street. The recommendations are based on a set of goals and objectives developed in community meetings in San Francisco's Chinatown. This report is the result of an intensive study and community effort. The report was prepared by the CHS Consulting Group, with extensive guidance from the Chinatown Community Development Center's Helen Qwan and Peter Ho, Jerry Robbins of DPT, and Steve Patrnick of San Francisco MUNI.

Stockton Street in Chinatown is a busy transportation corridor with extensive pedestrian activity, transit services, and vehicular traffic. Sidewalks are crowded and travel speeds are slow. Buses are generally full, despite high service frequencies, and MUNI's average speed in the study area is significantly lower than the system-wide average. Parking is difficult, and illegal and double parking common. Consequently, traffic delays are prevalent in the study area. The Central Subway project, which is currently in the planning stages, would provide an underground MUNI Metro connection between Market and Stockton Streets, greatly enhancing transit access to the Chinatown neighborhood.

By working with the Chinatown community, the project team established a set of goals and objectives for the project that address the community's concerns and desires for each transportation mode. Through additional meetings with the public and stakeholders, an extensive list of alternative improvements was developed and evaluated, both in terms of technical results and adherence to the goals and objectives for the project. Based on the community's input, the following improvements are recommended for Stockton Street:

Phase One Improvements

Management Alternatives

- Improved Enforcement by the Police Department, the Department of Parking and Traffic, and the Department of Public Works
- Parking Meter Enforcement Seven Days a Week

Physical Alternatives

- Delineated Pedestrian Walkway
- Corner Bulb-Outs
- Standardized Diagonal Crossing Striping
- Bi-Lingual Pedestrian Crossing Signs
- Scramble Signal at the Sacramento Intersection
- Consolidated Street Furniture



- Upgraded and Repaired Sub-Sidewalk Elevator Doors

MUNI Improvements

Phase One MUNI Improvements

- All-Door Boarding
- Articulated Buses

Phase Two MUNI Improvements

- Proof-of-Payment
- Modified Shelters

Phase Three MUNI Improvements

- Low Floor Buses
- Shuttle Route

Major Physical Improvements

- Widened Sidewalks
or
- MUNI Queue Jumps *or* Southbound Bus-Only Lane

This report discusses the process used in this project, defines the alternatives considered, evaluates the alternatives, provides cost estimates, and makes recommendations for implementation and further action for improvements to Stockton Street in Chinatown.



1.0 INTRODUCTION

The Stockton Street Enhancement Project is funded by a grant from the Metropolitan Transportation Commission's (MTC) Transportation for Livable Communities (TLC) program. This project is jointly managed by the Chinatown Community Development Center (CCDC), a 25-year old community nonprofit organization, and the San Francisco Department of Parking and Traffic (DPT). The purpose of the Stockton Street Enhancement project is to develop pedestrian and transit enhancements along Stockton Street in Chinatown from Broadway to the northern end of the Stockton Street Tunnel.

Stockton Street links Chinatown and the northeastern part of the City with Union Square, Moscone Convention Center, and regional freeways. It is a two-way street with one northbound lane and two southbound lanes in the study area. North of Broadway, Stockton Street has one lane in each direction and wider sidewalks.

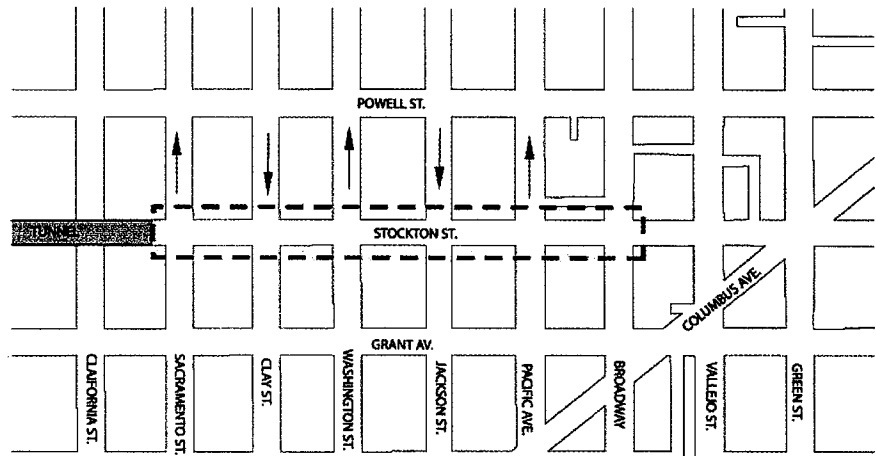


Figure 1. Study Area

The section of Stockton Street from the tunnel to Broadway is the heart of San Francisco's Chinatown. It is a vibrant commercial street with ground floor retail and a mix of offices and residences above. It also has several community and cultural uses in the southern part of the study area. Many of the retail shops sell fresh produce, meat, seafood, groceries, and Asian foods. These stores attract residents locally and from other parts of the region, and tourists. These businesses require extensive daily deliveries.

Stockton Street has gone through several incremental changes in the past and will continue to change in the near future. Following the construction of several public housing developments in Chinatown in the 1950's, the sidewalks in the study area were narrowed to their current width of approximately nine feet to accommodate traffic and MUNI buses in 1960.¹ In the early 1980's the City rearranged MUNI bus stops and created passenger loading platforms along the Chinatown portion of Stockton Street, in both the northbound and southbound directions. These passenger loading platforms are approximately 6 feet by 85 feet, protruding out from the regular sidewalks. Each loading platform is equipped with a bus shelter. Recently, as part of an effort to increase pedestrian safety, the DPT installed pedestrian scramble signals on four intersections along Stockton Street, with pedestrian

¹ From Department of Public Works Mapping Division.



countdowns. MUNI has a plan to extend its Third Street light rail transit line to Stockton Street (a project known as the Central Subway) with an underground station located at approximately Stockton and Clay Streets in the future.

Currently, the effective sidewalk width in the study area is insufficient to accommodate midday pedestrian volumes and activities. This situation is a result of a combination of factors: high pedestrian volumes; permitted merchandise displays that extend onto the sidewalk; illegal food displays and sales at the curb side of the sidewalk or in the parking lane; temporary storage of goods on the sidewalk during loading activities; street furniture on the sidewalk; shoppers congregating adjacent to the legal and illegal sidewalk stands; a relatively high number of senior citizens; high volumes of pedestrians carrying multiple shopping bags or carts; and groups congregating on the sidewalks to socialize. During peak periods, pedestrians spill out onto the street, and travel speeds are very slow.

Stockton Street is a major transit corridor as well. Every hour during peak periods, more than thirty buses on three routes run on Stockton Street in each direction. The trolley coach service frequency is every three minutes, with additional service provided by Line 9X. Despite the high bus service frequency, buses in the study area are generally full all day long, and often arrive in bunches. Because transit ridership is very high, passenger boarding delays are long even with back door boarding. Due to significant double parking, slow traffic through the corridor, and bus boarding delays, MUNI's overall travel time is long and average travel speed is low in the study area. The proposed Central Subway project will investigate ways to provide an underground MUNI Metro connection between Mission Bay and Chinatown. This connection would provide additional transit capacity that would be separated from vehicular traffic.

On-street loading and parking is available on both sides of the street. For most of the study area, parking spaces are reserved for truck loading between 8:00 AM and 2:00 PM. After 2:00 PM, the curb space becomes available for general parking. In general, the curb space is fully occupied throughout the day. In addition, the curb space is often illegally used. For example, some merchants use the parking lane to stage and store goods or to dispose of refuse, including pallets and boxes. Many delivery vehicles do not observe the thirty-minute time limit, with some staying in the space all day. Non-commercial vehicles regularly park in loading zones, and many overstay the designated time limits. Illegal parking in red zones and double parking are common occurrences, particularly on the west side of the street.

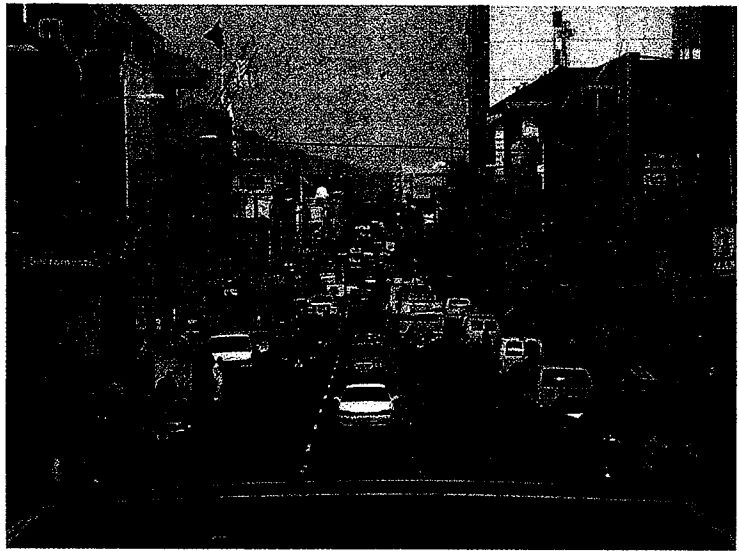


Figure 2. Stockton Street Corridor

Transportation problems along Stockton Street are complex and interrelated. There are many conflicting interests among various stakeholders. In addition, several city departments are involved in providing and managing transportation services and enforcing traffic, parking, and safety regulations. The project team worked with various stakeholders, including agency staff and the community at large, throughout the planning process.



2.0 COMMUNITY AND STAKEHOLDER MEETINGS

The project team conducted three community meetings to gather information about existing deficiencies, determine the goals and objectives of the project, assess the community's needs and desires for improvements, and evaluate the technical alternatives. In addition, team members met with community and agency stakeholders to discuss the existing conditions of the study area, develop alternatives, and review the evaluation of the alternatives.

2.1 Community Outreach

Three community workshops were held in Chinatown on January 7, 2003; February 11, 2003; and March 18, 2003. The first workshop familiarized the community with existing conditions and developed project-specific goals and objectives. The second presented project alternatives, and the last community workshop focused on evaluating project alternatives and selecting preferred alternatives. Participants of the third community workshop voted on the preferred alternatives. Summaries of these meetings are included in Appendix A.

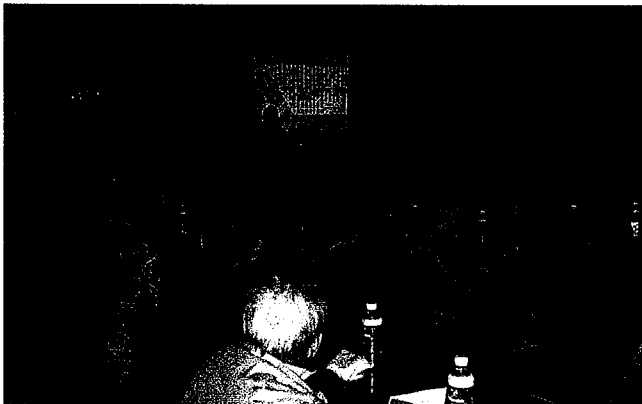


Figure 3. Presentation at a Community Workshop

Project team members made special presentations to community leaders as well as to various community groups, including the Chinatown Community Development Center Program and Board of Directors, the Chinatown Chamber of Commerce, and the Chinese Consolidated Benevolent Association. The team also worked with the media, including Chinese newspapers and television stations, to present progress reports to the larger community.

2.2 Stakeholder Meetings

Project team members met with stakeholder groups including the Stockton Street Commercial Corridor Group (SSCC) and the City of San Francisco's Downtown Streets Management Group (DSMG). SSCC is comprised of representatives from various city departments including the Department of Parking and Traffic (DPT), Department of Public Health (DPH), Department of Public Works (DPW), MUNI, and SF Police Department (SFPD); community agencies including Chinatown Community Development Center (CCDC), Charity Cultural Services, Chinatown TRIP; and individuals from the community. The DSMG includes MUNI, DPT and SFPD.



3.0 EXISTING CONDITIONS

3.1 Data Collection

Parking, pedestrian, and transit data were collected on several days between November 10, 2002 and December 11, 2002. Surveyors collected data on parking duration by space and vehicle type for one weekday and one weekend day. The details of double parking incidences, including type of vehicle, duration, and location, were collected for the same time periods. At each corner of the intersections with scramble signals, corner pedestrian volume data was collected for the weekday midday period. For non-scramble intersections, pedestrian crosswalk and corner volumes were collected for the same time period. MUNI boarding and alighting volumes and dwell times for each bus at each stop were collected for the weekday midday, weekday PM peak, and weekend midday periods. For the weekday midday period, signal delay for each bus was collected at each of the study intersections. MUNI bus travel speeds were collected for the weekday AM and PM peak periods. Traffic volume data was provided by DPT.

Table 1 summarizes the data collection periods by mode.

Table 1. Data Collection Periods by Mode

Mode	Weekday (10 AM-4 PM)	Sunday (10 AM-4 PM)	Weekday Midday (Noon-2 PM)	Weekday PM Peak (4-6 PM)	Saturday Midday (Noon-2 PM)
Parking and Loading	X	X	--	--	--
Double Parking	X	X	--	--	--
Pedestrian	--	--	X	--	--
MUNI	--	--	X	X	X

3.2 Data Analysis

3.2.1 On-street Parking and Loading Conditions

In general, on-street parking in the study area is fully occupied throughout the day, both on weekdays and weekends. Table 2 presents a summary of the parking survey data.





Figure 4. Boxes Stored on Stockton Street

The parking survey data shows that parking regulations are frequently disregarded. It is common for vehicles to park in a space longer than the allowed duration (generally thirty minutes); non-commercial vehicles are frequently parked in yellow zone spaces; and commercial vehicles occupying yellow zones are regularly not engaged in active loading. Further, merchants have been observed to use the on-street parking spaces in front of their stores for the staging and storage of merchandise, as well as for the disposal of boxes and pallets. The use of parking spaces for loading storage of boxes

and pallets occurs most frequently in the morning before 10:30 AM at the northern end of the study area, generally near Jackson Street and Pacific Avenue. However, boxes are stored on the sidewalk throughout the day. Double parking is common on Stockton Street, particularly on the western side of the street where there are two travel lanes. The California Vehicle Code allows commercial vehicles to double-park while actively loading or unloading goods if there is no curb space available.²

Table 2. On-Street Parking Supply and Occupancy and Average Duration

Type	Supply	Occupancy ^a		Average Parking Duration	
		Weekday	Sunday	Weekday	Sunday
Metered	12	94%	95%	1 hr. 32 min.	2 hr. 13 min.
Yellow	64	76%	94%	34 min.	2 hr. 14 min.
White	11	72%	89%	1 hr. 40 min.	4 hr.
Green	2	97%	100%	1 hr. 58 min.	5 hr. 53 min.
East Side	39	84% ^b	93% ^b	36 min. ^b	1 hr. 36 min. ^b
West Side	50	74% ^b	96% ^b	39 min. ^b	1 hr. 53 min. ^b
Total	89	78%	95%	38 min.	1 hr. 45 min.

Source: CHS Consulting Group

Notes: a. Occupancy is calculated by dividing the total duration of all of the observed vehicles by the number of spaces times the duration of the survey period.

b. Includes illegal parking in red zones.

² See California Vehicle Code Section 22502(b).

Parking occupancy rates were calculated based on the total amount of time each type of space was occupied throughout the survey period. The occupancy rate in Table 2 for yellow spaces is lower than what observations would suggest. In some cases, boxes and crates occupied loading spaces, making them unavailable to trucks. Large trucks occupied more than one space either due to their length or by “straddling” more than one space. The “remainder” of the space may not have been large enough to accommodate another truck, but would be shown as “unoccupied” in the data analysis.

Parking and loading turnover activity tends to be higher toward the northern end of the street, particularly for commercial vehicles. Average parking durations are significantly longer on Sunday when parking regulations are not enforced.

Stockton Street experiences extensive delivery activity throughout the day. After 2:00 PM, the metered yellow zones become available for the general public. However, commercial demand is not significantly lower between the hours of 2:00 PM and 4:00 PM than it is between 12:00 PM and 2:00 PM. While the total parking occupancy (both for commercial and non-commercial vehicles) does not change significantly between these two time periods, the number of automobiles increase somewhat and the number of commercial vehicles decrease somewhat.

3.2.2 Double Parking Conditions

Double parking is a common occurrence on Stockton Street. The following conditions were observed in the study area:

- Double parking occurs more frequently on the west side of the street than on the east side (84 versus 4 vehicles on weekdays and 158 versus 24 vehicles on Sundays). This is likely due to the existence of two travel lanes in the southbound direction.
- Double parking is more common on Sundays (182 vehicles) than on weekdays (88 vehicles).
- Double parking occurs consistently throughout the day, with a slight increase before noon.
- On weekdays, double parking is most common between Pacific Avenue and Broadway (approximately one-third of double-parked vehicles), and between Washington and Jackson Streets on Sundays (nearly half of the double-parked vehicles).
- On weekdays, slightly more commercial vehicles double park than non-commercial vehicles (44 percent non-commercial and 56 percent commercial). On Sunday, the majority of double-parked vehicles are non-commercial vehicles (80 percent).



3.2.3 Pedestrian Conditions

With the exception of the intersection of Stockton and Sacramento Streets, pedestrian volumes in the study area are high during the peak period between 11:00 AM to 2:00 PM. The sidewalk width available for pedestrian movement is narrow due to the presence of merchandise displays on the sidewalk, shoppers milling in front of those displays, street furniture, parking meters, and street lighting and traffic sign poles. In the most congested areas, the effective sidewalk width is approximately two feet. During peak periods, some pedestrians walk in the street because sidewalks are too congested. Mid-block jay-walking is not uncommon, particularly near bus stops.



Figure 5. Congested Corner on Stockton Street

A Level of Service (LOS) analysis was conducted for all of the corners in the study area. The LOS of each corner is based on the available square feet per person waiting at the corner immediately prior to the green pedestrian phase. All of the corners except for the intersection of Stockton and Sacramento Streets operate at LOS F during the midday period. In other words, the corner space is insufficient to accommodate the number of pedestrians waiting to cross the street and turning the corner. This is not unexpected due to the high volumes of pedestrians and the presence of scramble signals. Unlike traditional signals, the scramble system in Chinatown instructs all pedestrians to wait at the corner at one time, rather than allowing the north-south movement to proceed while the east-west is stopped, for example. This in part results in a large number of people waiting in the corner area to cross the street.



Figure 6. Crowded Mid-Block Conditions

Although pedestrian LOS for the mid-block sections of Stockton Street were not calculated, field observations repeatedly found that mid-block areas were more crowded than corners. Due to the high pedestrian volumes and presence of obstacles on the sidewalks, pedestrian circulation in mid-block areas was significantly congested during peak periods, particularly on weekends. In some locations, pedestrians regularly spilled out into the parking and traffic lanes to proceed around the most congested mid-block locations.

The crosswalk LOS was analyzed for the two intersections with traditional traffic signals: Stockton and Sacramento Streets as well as Stockton Street and Broadway. All of the crosswalks at these intersections operate at acceptable LOS during the midday period, meaning that they are sufficiently wide and that pedestrians are able to move freely across them. All of the crosswalks at Stockton and Sacramento operate at LOS A, while the crosswalks at Stockton and Broadway operate at LOS C or D.

The LOS of the scramble intersections were not analyzed. However, given the fact that the entire intersection area is available to pedestrians, the pedestrian crossing area in the scramble intersections is expected to easily accommodate all of the pedestrians.

3.2.4 Accident Data

Vehicle and pedestrian accident data for the last five years (1997 through 2001) was reviewed for the study area. There are no data available for the time period *after* the implementation of the scramble signals. It should be noted that the pedestrian accident data only include reported accidents. Like other areas in the City, not all pedestrian accidents are reported by the people involved.

DPT accident data indicate that highest number of *vehicle* accidents occur at the intersections of Stockton and Sacramento (13 over five years) and Stockton and Broadway (22 over five years). Of the thirteen accidents, eight accidents involved *pedestrians* over the five year analysis period. Of these, five were caused by left turn vehicles from westbound Sacramento Street to southbound Stockton Street. This intersection has the lowest pedestrian volumes (by a factor of two to five) of all the study intersections.

While DPT does not have a specific threshold in terms of the number of pedestrian accidents beyond which the City takes remedial action, it has recently implemented various projects throughout the City aimed at improving pedestrian circulation and safety conditions. These include pedestrian countdown signals, improved crosswalk markings, sidewalk widening, new WALK/DON'T WALK pedestrian signal heads, bulb-outs at corners, pedestrian scramble signals, and pedestrian safety campaigns. Corner bulb-outs have recently been installed at numerous intersections on Van Ness Avenue. As reported on the City of San Francisco's website, "DPT and the SF Department of Public Health launched a joint publicity campaign in March 2003, aimed at bringing common courtesy back to our streets and sidewalks. The campaign encourages drivers and pedestrians to acknowledge one another through non-verbal communications such as smiling and waving, with the intention of reducing accidents and everyday stress on the road."³

³Website http://www.sfgov.org/site/dpt_index.asp?id=13489#news, accessed April 7, 2003.



3.2.5 MUNI Operations

MUNI operates three primary routes – Lines 9X, 30, and 45 – along Stockton Street in the study area. Line 9X has two secondary routes, the 9AX and the 9BX that provide weekday peak period, peak direction service only. Line 9X is an express route providing service between Visitacion Valley, Downtown, and Chinatown. Line 9AX covers a route similar to 9X, but provides express service between Santos Street and Bayshore Boulevard on Geneva Avenue and between Geneva and Arleta Street on Bayshore. Route 9BX covers the same route as the 9X, but provides express service north of Arleta and Bayshore. Line 30 provides service between the Marina District and the Caltrain Station at Fourth and King Streets. Recent service changes include a short run that turns around at Van Ness Avenue. Line 45 connects Cow Hollow and Union Street with the Caltrain Station. The combined headway for Routes 30 and 45 through the study area is three minutes. Table 3 lists each routes' hours of service and frequency for weekdays, Saturdays, and Sundays.

Some of these lines will be modified when MUNI implements the Central Subway project. The Central Subway will extend the Third Street LRT line in a subway configuration from its Initial Operating Segment at Fourth and King Streets to Chinatown. A tentative station location has been identified at Stockton and Clay Streets.

Table 3. Existing MUNI Service on Stockton Street

		Line 9X ^a	Line 9AX	Line 9BX	Line 30	Line 45	Total
Weekday	Hours of Service	7:00 AM to 3:45 PM	4:00 PM to 6:00 PM	4:00 PM to 6:00 PM	24 Hours ^b	6:00 AM to 1:00 AM	
	Peak Period Buses/Hour	6	6	6	15	8	41
	Midday Buses/Hour	5	–	–	10	10	25
Saturday	Hours of Service	9:30 AM to 6:00 PM	None	None	24 Hours ^b	6:00 AM to 1:00 AM	
	Buses/Hour	4	–	–	10	5	19
Sunday	Hours of Service	None	None	None	24 Hours ^b	6:00 AM to 1:30 AM	
	Buses/Hour	–	–	–	6	4	10

Source: SF MUNI

Notes: a. The 9X provides service in the southbound direction only on Stockton between Broadway and Sacramento.
b. Between 1:00 AM and 5:30 AM, service is provided on Stockton by the 91-Owl, which operates approximately 2 buses per hour.



MUNI buses run more slowly in the study area (3.8 miles per hour during the AM peak and midday periods) than the citywide average of 8.1 miles per hour.⁴ Buses travel at the same average speed (which includes dwell time at stops and delays at traffic signals) in both the northbound and southbound directions during the AM peak and midday periods. Slow speeds are exacerbated during the afternoon peak periods. In the northbound direction, buses travel at an average speed of 3.6 miles per hour, and 2.6 miles per hour in the southbound direction during the PM peak period.



Figure 7. Bunched Buses on Stockton Street

Table 4 summarizes MUNI operations in the study area for the weekday midday period.

Table 4. Existing Weekday Midday MUNI Operations on Stockton Street

Direction	Average Travel Time	Average Speed	Number of Bus Stops	Total Dwell Time	Percent of Travel Time at Stops	Total Delay at Signals	Percent of Travel Time at Signals
Northbound	374 sec	3.8 mph	2	75 sec	20%	140	37%
Southbound	368 sec	3.8 mph	3	122 sec	33%	107	29%
Both	742 sec	3.8 mph	5	197 sec	27%	247	33%

Source: CHS Consulting Group

During a typical weekday midday, a MUNI bus takes approximately 374 seconds (6 minutes and 14 seconds) to travel between Sacramento Street and Broadway in the northbound direction, with an average speed of approximately 3.8 miles per hour. This is an increase of approximately 78 seconds (1 minute 18 seconds) over the time it takes to travel the same distance and direction during the early morning non-peak period.

In the southbound direction during a weekday midday, a MUNI bus takes approximately 368 seconds (6 minutes 8 seconds) to travel between Broadway and Sacramento Street at an average speed of 3.8 miles per hour. This is an increase of approximately 73 seconds (1 minute 13 seconds) over the time it takes a bus to travel the same distance and direction during the early morning non-peak period.

⁴ Total Motor Coach and Trolley Coach Annual Revenue Miles divided by Total Motor Coach and Trolley Coach Annual Revenue Hours for FY 2000, from *MUNI Short Range Transit Plan 2002 - 2021*.



On average during a weekday midday period, a bus spends 57 percent of its travel time stopped in the northbound direction and 62 percent stopped in the southbound direction during a typical weekday midday. In the northbound direction, a bus spends on average 20 percent of its time stopped at a bus stop and 37 percent stopped at a signal. In the southbound direction, a bus spends on average 33 percent of its time stopped at a bus stop and 29 percent stopped at a signal. Average signal delay is longer in the northbound direction than the southbound direction.

3.3 Additional Community Concerns

The project team met with community members and stakeholders to develop a comprehensive list of transportation issues of concern. In general, the community and stakeholders were in agreement with the data analysis findings and added a few issues, including:

- ***Slippery sidewalks.*** Community members were concerned that wastewater discharged by merchants often leads to slippery sidewalk conditions.
- ***Unsafe sidewalks.*** Several community members reported uneven and slippery metal doors to sub-sidewalk vaults.
- ***Unreported pedestrian accidents, particularly with seniors.*** Community members raised the issue that accident data from the City does not include unreported accidents, which often involve only pedestrians. Examples of these types of accidents include seniors who fall on crowded sidewalks.



4.0 GOALS AND OBJECTIVES

The project team developed mode-specific goals and objectives with the community at the first community workshop on January 7, 2003. These goals and objectives were used to guide the development of project alternatives and then to evaluate the benefits and impacts of the proposed alternatives.

Pedestrian

1. Improve pedestrian flow while maintaining vitality of street.
2. Provide safe, comfortable, and clean pedestrian walkways.

Transit

1. Decrease bus overcrowding.
2. Improve orderliness of boarding and alighting.
3. Reduce traffic delays and increase average bus speed.

Traffic

1. Reduce congestion and minimize conflicts between pedestrians and vehicles without increasing traffic speeds or volumes.

Parking and Loading

1. Reduce violations.
2. Increase availability of parking spaces.
3. Achieve optimal distribution of curb spaces.



5.0 PROJECT ALTERNATIVES AND EVALUATION

5.1 Process

Project alternatives were developed by the project team in conjunction with the community and stakeholder groups. In most cases, the consultant and project sponsors developed an initial list of alternatives, which was presented at meetings to the community and stakeholders for additional input.

5.2 Evaluation Criteria

The various alternatives were evaluated based on their effectiveness to meet project goals and objectives, their benefits and impacts, and their implementation feasibility.

5.3 Evaluation

Table 5 presents a summary of the benefits and impacts to the project's goals and objectives for each alternative. Additional details about the evaluation of each alternative is provided in the following section of the report.



Table 5. Summary of Benefits and Impacts for Each Alternative

Alternatives	Goals and Objectives								
	Pedestrians			Transit			Traffic	Parking and Loading	
	1. Improve Pedestrian Traffic Flow	2. Safety, Comfort, Cleanliness	1. Reduce Overcrowding	2. Improve Orderliness of Boarding and Alighting	3. Reduce Delays and Increase Speed	1. Reduce Congestion and Minimize Conflicts	1. Reduce Violations	2. Increase Availability of Parking	3. Optimize Distribution of Curb Space
Improve Enforcement	+	+			+	+	+	+	+
Seven Day Parking Meters					+	+		+	
Overnight Deliveries Only	+	+			+	+		+	+
All-Door Boarding				+	+				
Articulated Buses			+	+	+				
Proof-of-Payment				+	+				
Modified Bus Shelters				+					
Shuttle Bus Route			+	+	+				
Low Floor Buses				+	+				
Delineated Pedestrian Walkway	+	+							
Corner Bulb-Outs	+	+			+	+		—	
Diagonal Crossing Striping		+				+			
Pedestrian Crossing Signs		+				+			
Scramble at Sacramento Street		+			—	—			
Consolidated Street Furniture	+	+							
Upgraded Sub-Sidewalk Doors		+							
Southbound Bus Queue Jump					+				
Southbound Bus-Only Lane					+				
Northbound Bus- and Truck-Only Lane					+				
Widened Sidewalks	+	+				—			

5.4 Alternatives

Alternatives are organized into to three categories: management improvements, operational improvements, and physical improvements.

5.4.1 Management Improvements

Management improvements involve on-going strategies to improve and then maintain smooth transportation operations. In general, these alternatives involve enforcement programs.

Improved Enforcement by City Departments and Divisions

The purpose of this alternative is to increase the effective sidewalk width, improve sidewalk and street cleanliness, increase parking turnover and therefore availability, and reduce double parking.

A variety of City departments and divisions share the responsibility of enforcing regulations pertaining to the use of sidewalks, parking spaces, and streets. Parking violations such as unpaid meters, parking in a red zone, non-commercial vehicles in yellow zones, and commercial vehicles that are not actively loading in yellow zones are under the jurisdiction of DPT. Moving violations are enforced by SFPD. DPW is responsible for enforcing illegal dumping and obstructions of pedestrian walkways, including illegal storage of boxes or crates on sidewalks, unclean sidewalks, and the use of sidewalks for merchandise displays without a permit or beyond the permitted area. Appendix B provides a summary table of these activities and fines for violations.

Many City departments describe themselves as being “complaint driven.” When citizen complaints rise in a particular area, enforcement efforts increase in that area. Sometimes, enforcement efforts become too strong for local merchants, who in turn may complain to City agencies and political leaders, resulting in reduced enforcement. More often, however, a period of strong enforcement results in better compliance with the rules. When this occurs, the agency reallocates its resources to another area. With the strong enforcement gone, rules are broken more frequently, and citizen complaints rise once again. This ebb and flow of enforcement is exacerbated in times of financial crisis. In neighborhoods with large immigrant populations such as Chinatown, residents are often less likely to ask for enforcement assistance.

Currently, different segments of Stockton Street are covered by different enforcement officers. DPT staff have suggested changing the existing parking enforcement beats to include Stockton Street from Broadway to the tunnel as a single beat. With Stockton Street as one beat, enforcement would be more systematic and focused, as officers would not be drawn away to other streets. In addition, the department would have better accountability for enforcement, as only one officer would be responsibility for the street.

In a separate forum, the Stockton Street Commercial Corridor (SSCC) group has identified the fragmented enforcement structure as a hindrance to effective enforcement efforts. SSCC has



developed a set of improvements that include cross-training of enforcement officers, enforcement by teams comprised of individuals from the various agencies, an escalation of fines for repeated violations of permit regulations, and improved weekend enforcement. SSCC's work has helped clarify departmental enforcement jurisdiction regarding non-vehicular use of the parking lane.

In conjunction with SSCC's efforts, the following elements are recommended for inclusion in the improvement strategy:

- Increase fines for storing crates and boxes on sidewalks and in parking spaces; violating the two-foot sidewalk stall limit; illegally dumping and discharging waste water and garbage; and conducting non-permitted sidewalk sales. Increasing fines will make the consequences of violations more onerous as well as generate additional revenue for the enforcement program. These two benefits are particularly important, given the City's current financial condition and reduction in enforcement personnel.
- Raise the fee for the use of sidewalk space by merchant stalls. The current annual permit fee is \$4.80 per square foot of sidewalk area, plus a one-time processing fee of \$100. This annual rate is significantly lower than the prevalent rent for ground-floor space.
- Improve enforcement of the two-foot depth limitation for sidewalk merchandise displays. The implementation of another alternative, the delineated pedestrian walkway, could aid enforcement personnel.
- Repaint and coordinate parking regulation signage both on the curb as well as on the signs throughout the corridor. The existing curb paint has eroded and is difficult to see. The existing parking signs are often confusing and difficult to understand, and in some cases inconsistent with curb markings.
- Establish an education program for regulations and enforcement. This program would educate the merchants about the City's rules and regulations and the fines for violations, and educate the public about parking and traffic regulations. This program could be administered and implemented by a community organization such as CCDC on behalf of the City. Outside funding and sponsorship may be available for such a program.

The evaluation of this alternative involved reviewing both the qualitative results of changes to the enforcement program, as well as a quantitative analysis of the results of eliminating all double parking on traffic operations.



Benefits

Pedestrian:

- Increases the effective sidewalk width available for pedestrians by limiting merchant displays to the permitted two-foot width, removing trash and debris, and preventing merchants from selling goods in the parking lane and at the curb edge of the sidewalk.
- Improves pedestrian safety by cleaning sidewalks and reducing the likelihood of tripping and slip and fall accidents.

MUNI and Traffic:

- Improves MUNI speeds and traffic flow in the study area; the technical analysis conducted for the Major Physical Improvements found that eliminating double parking was the most effective means.

Parking and Loading:

- Increases the availability of on-street parking due to fewer vehicles overstaying posted time limits.
- Increases the availability of loading spaces for deliveries due to fewer non-commercial vehicles parked in yellow zones and fewer trucks overstaying posted time limits.

Impacts

- Decreases the amount of space merchants who use more than the permitted two-foot width would have for staging and storing merchandise.
- Prohibits merchants who currently sell goods from sidewalk curbs and parking lanes to continue this illegal practice.
- Requires City enforcement agencies to reorganize and hire new personnel.

Parking Meter Enforcement Seven Days a Week

To increase parking turnover and the availability of on-street parking spaces, this alternative would require parking meters to be enforced seven days a week from 7:00 AM to 6:00 PM. In general, metered parking is limited to one hour, with yellow zones limited to 30 minutes. This alternative requires additional enforcement staffing on Sundays, and could lead to the creation of a new Parking Control Officer (PCO) beat on Stockton Street. If meters need to be enforced only on one street on Sunday, DPT would likely assign one person to enforce that area. This would facilitate enforcing Stockton Street as a single beat on weekdays as well.

The survey data shows that average parking duration increases significantly on Sundays, when meters are not in effect. This is particularly evident in the yellow zone spaces. Table 6 shows the variation in parking duration between weekdays and Sunday for metered and yellow zone spaces.



Table 6. Comparison of Weekday and Sunday Parking Duration

Type of Space	Average Weekday Parking Duration	Average Sunday Parking Duration	Percent Change
Meter	1 hour, 32 minutes	2 hours, 13 minutes	+45%
Yellow Zone	34 minutes	2 hours, 14 minutes	+294%

Source: CHS Consulting Group

Benefits

- Increases parking turnover rates on Stockton Street on Sundays.
- Increases availability of parking.
- Decreases incidence of double parking.

Impacts

- Requires DPT to reorganize its enforcement workforce and hire new personnel.

Deliveries During Overnight Hours Only

The purpose of this alternative is to increase the availability of on-street parking as well as the effective sidewalk width for pedestrians. This alternative would limit commercial deliveries to overnight hours only. Truck unloading and merchandise staging would not occur during daytime hours. Stockton Street would not be closed to trucks during the day, but trucks making deliveries during the day could be fined. Overnight parking enforcement would be required to ensure that the curb spaces would be available to trucks.

The City of San Francisco has considered restricting deliveries to overnight hours for the Central Business District in the recent past. This proposal was met with strong resistance from both delivery companies and businesses receiving deliveries. Merchants would need to have a staff person available during overnight hours in order to receive deliveries, and delivery companies would need to modify their schedules to accommodate the new requirement. Another issue to consider on Stockton is that many of the buildings have ground floor retail shops with residential apartments above. In addition to resistance from businesses, residents may have concerns about increased noise at night associated with deliveries. This concept would require additional feasibility analysis and community outreach to better understand its benefits and constraints.

Benefits

- Increases availability of on-street parking during daytime.
- Eliminates staging and storage of goods on sidewalks and in parking lanes during the day, increasing the effective sidewalk width for pedestrians as well as the availability of on-street parking.
- Eliminates potential conflicts between deliveries into stores and pedestrians.

Impacts

- Disrupts existing business operations on Stockton Street.



- Requires enforcement to keep curb spaces available to trucks overnight.
- Reduces the availability of overnight parking on Stockton Street.
- Generates noise from nighttime deliveries.

5.4.2 Operational Improvements

The following operational alternatives relate to the way in which MUNI provides transit service on Stockton Street.

All-Door Boarding

The purpose of this alternative is to reduce MUNI dwell times and reduce total travel time in the study area.

For many years, MUNI passengers on Stockton Street have boarded buses through both front and back doors, rather than solely the front door. In recent months, MUNI has worked to eliminate this practice by stationing personnel at the Stockton Street bus stops to prevent rear-door boarding. This alternative would return MUNI boarding operations to the previous practice of allowing rear-door boarding.



Figure 8. All-Door Boarding on Stockton Street

Benefits

- Reduces dwell times at bus stops.
- Improves overall running times.

Impacts

- Increases fare evasion, resulting in nominal revenue loss. This loss is anticipated to be the same level as it was prior to MUNI's deployment of staff to prevent rear-door boarding in Chinatown.

Articulated Buses

This alternative would substitute articulated buses for the existing fleet on Route 30 east of Van Ness Avenue. The purpose of this alternative is to increase bus passenger capacity on Stockton Street, reduce overcrowding on buses, and reduce boarding delay.

MUNI has investigated substituting articulated buses for Route 30 in the past, and has purchased buses for this service. However, opposition from the Marina District prevented their implementation. By using articulated buses only on the segment of Route 30 east of Van Ness Avenue, MUNI may be able to avoid the opposition it faced in the previous effort. Recent service changes include a short run on Route 30 that turns around east of Van Ness. Articulated buses are currently deployed on the short route on weekends, and MUNI plans to deploy the larger buses on weekdays in the future. This transition may coincide with the arrival of the new trolley coaches that MUNI has ordered.

Benefits

- Increases capacity and reduces overcrowding. Each articulated bus has approximately 50 percent more capacity than the forty-foot trolley coaches currently deployed on Route 30.
- Reduces boarding delays caused by crowding on bus platforms and in buses.

Impacts

- Reduces service frequencies for Route 30 in the Marina District, if articulated buses are only used on short runs east of Van Ness Avenue.

Proof-of-Payment

The purpose of this alternative is to decrease bus dwelling time at the stops by enabling passengers to board through any door.

Proof-of-Payment is a fare collection method that requires all passengers to have a fare receipt (either a pass or a transfer) while on the bus. Drivers are not required to verify that passengers have passes. Pre-paid passengers may board through the front and rear doors of the bus, speeding up the boarding process. Fare inspectors randomly check for fare receipts and issue citations to violators. On Stockton Street, inspections would occur at bus stops as passengers alight, rather than on board buses. MUNI has implemented Proof-of-Payment on its LRT Metro lines.

A proof-of-payment system for MUNI Routes 30 and 45 has been analyzed by MUNI in the past. The summary report from this work “recommends the 30-Stockton / 45-Union as the most appropriate service to demonstrate

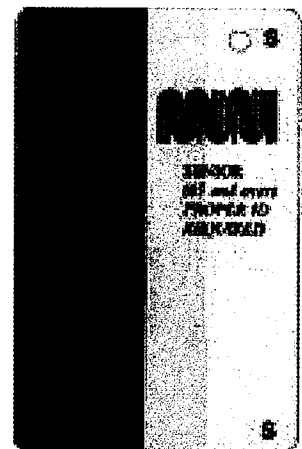


Figure 9. MUNI Pre-Paid Fast Pass

Proof-of-Payment on MUNI's rubber-tired fleet.”⁵ As the report states:

... Crowding (and queuing for the bus, a function of high patronage) may be eased by the implementation of a Proof-of-Payment system. This assumption depends upon the number of prepaid fares. MUNI staff surveys indicate that the Stockton Street service has a high degree of prepaid fares (about 83 percent of passengers already use a monthly pass).

Finally, community support for a pilot project on the 30 and 45 lines is strong in Chinatown, and the community has indicated its desire to assist with public information and marketing of the program.⁶

With adequate fare inspection, the potential revenue losses associated with a proof-of-payment system can be minimized.

Benefits

- Reduces boarding times.
- Reduces overall running times. This time savings may enable MUNI to deploy fewer buses and still provide the same level of service.

Impacts

- None.

Shuttle Bus Route

The purpose of a shuttle bus route from Chinatown to Market Street is to increase transit capacity in the area, reduce overcrowding, and reduce boarding delays.

In this alternative, a supplemental bus route would be implemented for the busiest section of the Stockton Street corridor, from Washington Square to South-of-Market on Folsom Street. Figure 10 provides an example of a possible shuttle route. Shuttle service would supplement existing routes in the corridor rather than replace current service. A more detailed operational analysis would be required to determine the most efficient and effective route and level of service.

A shuttle bus may not be necessary if articulated buses are deployed on Stockton Street and have sufficient capacity to mitigate existing overcrowding. Furthermore, the planned Central Subway extension would provide increased transit capacity in the long run. More extensive operations analysis is needed to quantify the benefits and impacts associated with this conceptual alternative.

⁵ *San Francisco Municipal Railway Proof-of-Payment Fare Collection Implementation Plan, Muni Metro System and Bus Demonstration Program*, Produced by Pacific Transit Management for San Francisco Municipal Railway Service Planning Department, January 26, 1998, p. 15.

⁶ Ibid.



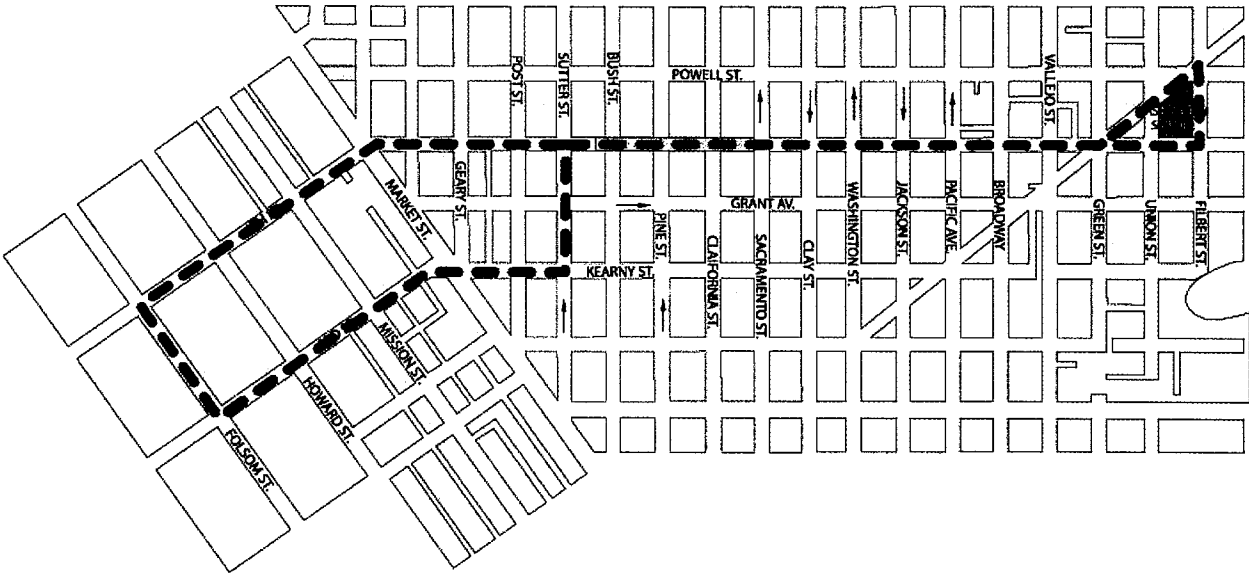


Figure 10. Sample Stockton Street Shuttle Route

Benefits

- Increases transit capacity and reduces overcrowding.
- Reduces boarding delays caused by crowding on bus platforms and in buses.

Impacts

- Requires more study. Operational difficulties exist with the sample route, including the availability of layover space at both ends of the route and adequate turning radii near Washington Square.

Low Floor Buses

The purpose of this alternative is to reduce boarding times and improve MUNI's running time in the corridor.

This alternative would substitute low floor buses for the existing fleet on Routes 30 and 45. Low floor buses do not have stairwells between the doors and the seating area, and are generally equipped with wider doorways than standard buses. As passengers do not have to "step up" onto the bus, boarding is easier and faster, particularly for the elderly and disabled. Wider doors enable more passengers to board and alight simultaneously.

Boarding times for low floor buses are shorter than for standard high floor buses. Data from several North American transit agencies reveal a time savings in the

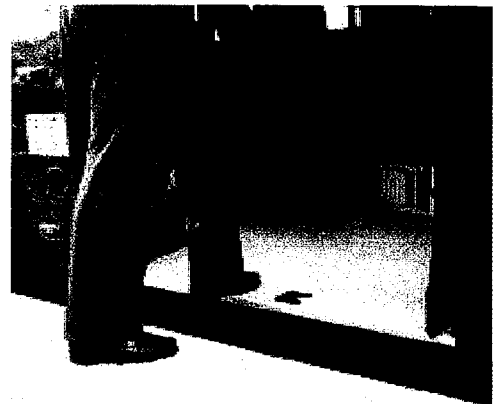


Figure 11. Passengers Boarding Low Floor Bus

range of 0.2 to 2.2 seconds per passenger.⁷ Time savings are generally higher for seniors and people who have difficulty with stairs. Deploying low floor buses may not be necessary if articulated buses are deployed on Stockton Street and have sufficient capacity to mitigate existing overcrowding.

Benefits

- Reduces dwell times and running times.

Impacts

- Reduces per bus passenger capacities. Low floor buses accommodate five to ten fewer passengers than traditional buses currently in use.

5.4.3 Physical Improvements

The following alternatives would make physical changes to the Stockton Street study area, including changes to the roadways, sidewalks, and street furniture.

Delineated Pedestrian Walkway

Delineating the pedestrian walkway area of the sidewalks in the corridor with special paving and/or color would increase effective sidewalk widths and facilitate easier enforcement.

The delineated area would encompass the sidewalk area approximately two feet from the building edge to two feet from the curb. Other areas would accommodate permitted merchant sidewalk displays along building facades and street lighting poles, parking meters, and clear distance for parked vehicles' doors and side mirrors along the curb.

Merchants and enforcement agencies would be able to monitor the width of merchandise displays on the sidewalk more easily. In addition, the pavement markings may have an effect on pedestrians' perception of the area, facilitating smoother pedestrian flows.

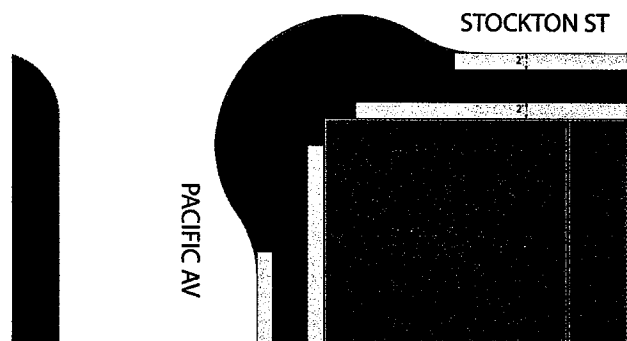


Figure 12. Example of a Delineated Pedestrian Walkway

Benefits

- Improves pedestrian circulation by reducing sidewalk obstacles.

Impacts

- None.

⁷ Rolland King, *Transit Cooperative Research Program Report 41: New Designs and Operating Experiences with Low-Floor Buses*, National Academy Press, 1998, p. 23.

Corner Bulb-Outs

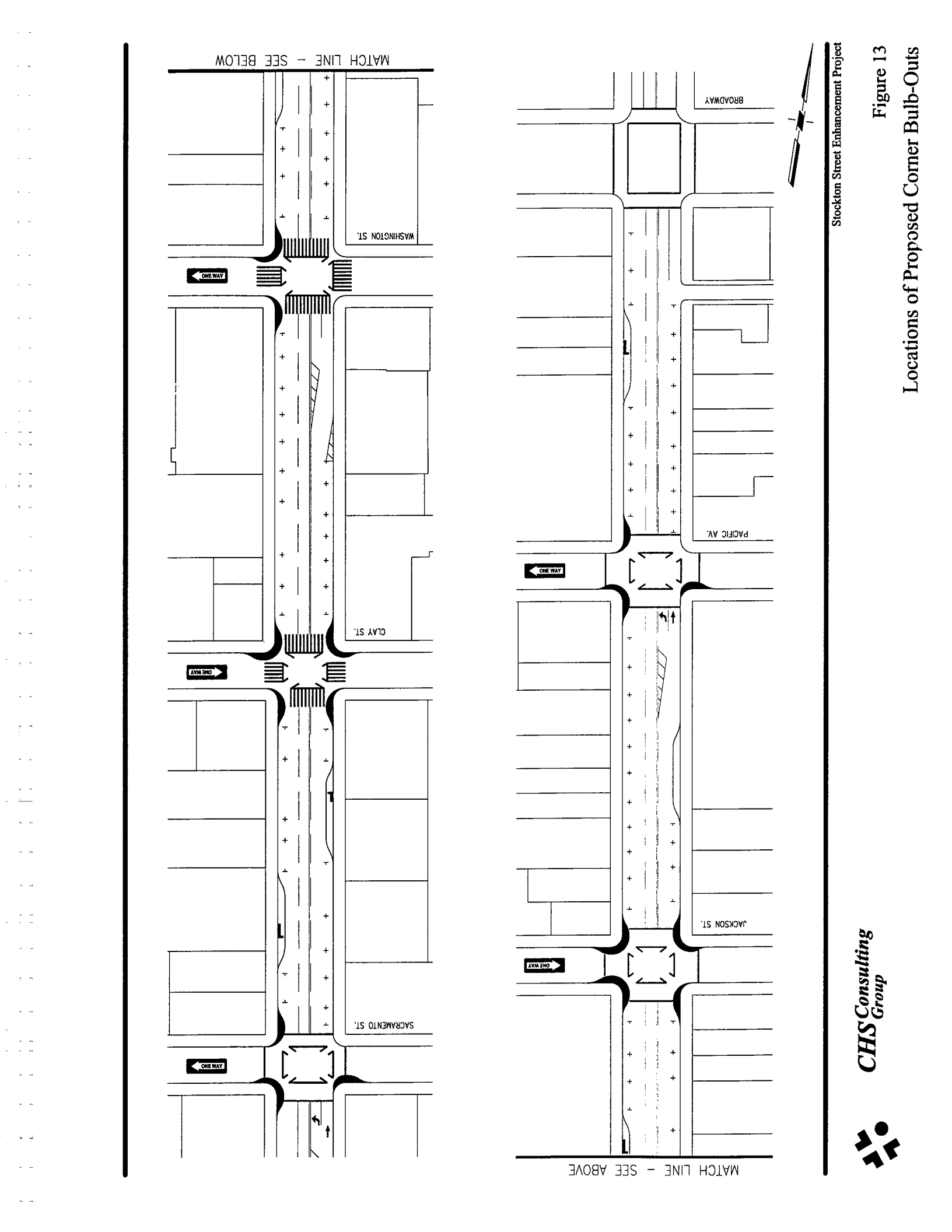
This alternative proposes the installation of corner bulb-outs at all intersections in the study area where feasible. The purpose of this alternative is to improve pedestrian safety by enlarging the area available for queuing as well as improve Americans with Disabilities Act (ADA) accessibility with corner ramps. In addition, the installation of corner bulb-outs may reduce pedestrian crossing distances and times, especially for the pedestrian scramble phase. These time savings could be used to increase the green time for vehicular traffic on Stockton Street.

The feasibility of a corner bulb-out was reviewed for all corners of each study intersection. Standard bulb-outs were modified in order to accommodate truck turning radii, a contra-flow school bus lane on Washington Street, and peak hour bus-only lanes. Figure 13 shows the proposed locations of corner bulb-outs on Stockton Street.

Traffic and MUNI travel time changes associated with the installation of the corner bulb-outs were analyzed using the CORSIM computerized simulation model. CORSIM is a microscopic simulation model that represents the movements of individual vehicles, including influences of driver behavior, through a street network. Field survey data was inputted into the model for the baseline condition, and changes to the roadway and signal network were entered for each alternative. The results of the model analysis are presented below and in Appendix C. Figure 14 shows the change in travel time for MUNI buses and all vehicles associated with implementing corner bulb-outs under four scenarios:

- Bulb-outs only;
- Bulb-outs and improved enforcement to eliminate double parking;
- Bulb-outs and improved MUNI operations;
- Bulb-outs, improved double-parking enforcement, and improved MUNI operations.





CHS Consulting
Group

Stockton Street Enhancement Project

Figure 13

Locations of Proposed Corner Bulb-Outs

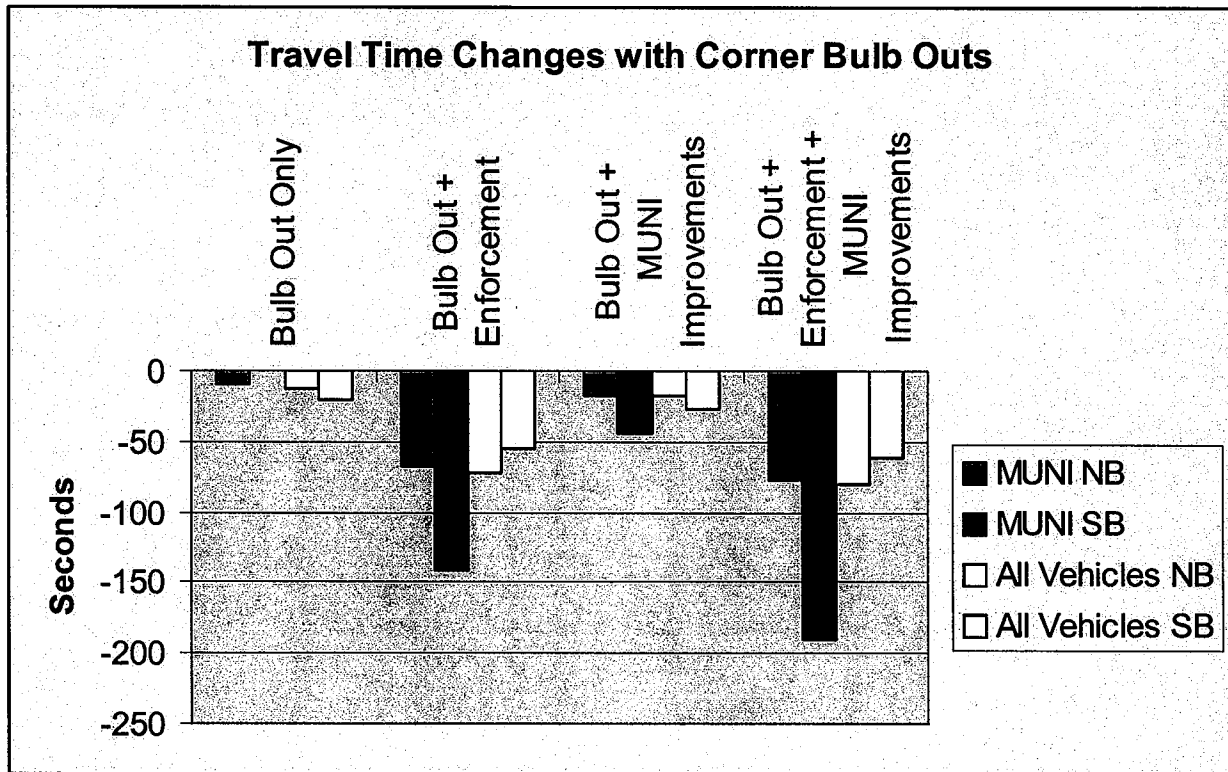


Figure 14. Travel Time Changes with Corner Bulb-Outs

Currently, merchants are allowed to have permitted merchandise displays extend to the corner of their buildings. Community members have stated that these displays limit the corner space available for pedestrians queuing to cross the street and maneuvering room to turn the corner. With the installation of corner bulb-outs, the City should consider modifying the sidewalk display permit regulations to ensure that the corner area is clear for pedestrian circulation, queuing, and access to ADA ramps. This could include restrictions on how close sidewalk displays can be located to the corner of buildings.

Benefits

- Increases corner queuing area for pedestrians waiting to cross the street.
- Improves travel time speeds for buses and vehicular traffic by reducing pedestrian crossing times and lengthening vehicular green time.
- Double-parking enforcement improvements generated the most significant benefits.

Impacts

- Marginally decreases availability of on-street parking.

Standardized Diagonal Crossing Striping

The purpose of this alternative is to improve pedestrian safety by making intersection operations more understandable for pedestrians and by increasing the visibility of scramble intersections for drivers. The existing crosswalk striping does not signify to pedestrians or drivers that scramble signals are in operation. This alternative would repaint pedestrian scramble intersections with the Manual on Uniform Traffic Control Devices' (MUTCD) national standard striping design.

Traditionally-striped intersections near schools could be restriped with zebra stripes.⁸

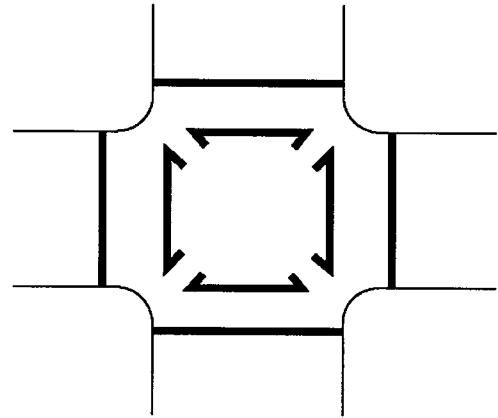


Figure 15. MUTCD Standard Striping for Scramble Intersections.

Benefits

- Signals to drivers and pedestrians that pedestrians are permitted to cross diagonally.

Impacts

- None.

Larger Bi-Lingual Pedestrian Crossing Signs

The installation of larger bi-lingual pedestrian crossing signage at scramble intersections would improve non-English-proficient, Chinese-speaking residents' and visitors' understanding of the system, and reduce jaywalking in the area.

Existing bi-lingual signs in Chinatown that provide information to pedestrians about scramble signal operations are small and not prominent enough to fully assist pedestrians. Enlarging signs and installing them in more visible locations would provide an on-going educational tool for the community. With a relatively high immigration rate, permanent and effective public information systems are necessary.



Figure 16. Existing Bi-Lingual Pedestrian Crossing Sign

⁸ DPT funds for zebra crosswalks are currently limited to crosswalks near schools on major streets. Additional funding would allow this program to be expanded to other streets.

Benefits

- Improves legibility of scramble signal operations easier for the Chinatown community.

Impacts

- Increases visual clutter.

Scramble Signal at the Sacramento Street Intersection

The goal of this alternative is to increase pedestrian safety at the Sacramento Street intersection by reducing conflicts between vehicles and pedestrians, and standardizing signal operations south of Broadway.

Installing a scramble signal at the Stockton and Sacramento intersection has been suggested in the past as a means of improving pedestrian safety and providing consistency for Stockton Street intersection operations. This intersection was considered for a scramble signal prior to the City's implementation of the other scramble signals on Stockton Street.

Pedestrian accident data shows that the Stockton and Sacramento intersection has a higher number of vehicle/pedestrian accidents than other intersections in the study area, with the exception of the Broadway intersection. However, because pedestrian volumes at the Sacramento Street intersection are significantly lower than at Broadway, the pedestrian accident rate at Sacramento is substantially higher than at the other intersections. During the five years for which accident data is available, five of the eight pedestrian accidents at the Sacramento Street intersection were caused by vehicles turning left from Sacramento (westbound) onto Stockton (southbound). A scramble system at this intersection would eliminate this type of vehicle/pedestrian conflict.

It is important to note that while the installation of a scramble signal would increase signal delays for MUNI buses and other vehicles on both Sacramento and Stockton Streets, these impacts would be similar to those experienced at other the intersections with scramble signals. Alternative signal designs may be able to reduce conflicts between vehicles and pedestrians without significantly impacting MUNI and traffic operations. Further analysis of these options would be required.

Benefits

- Improves pedestrian safety by eliminating conflicts between pedestrians and turning vehicles.

Impacts

- Increases signal delay for MUNI buses and vehicles on both Stockton and Sacramento Streets.



Consolidated Street Furniture

This alternative would reduce the number and size of obstacles on sidewalks by consolidating garbage cans, news racks, and other street furniture to maximize the effective sidewalk width and maintain clear corner queuing areas. This alternative could include the removal of non-permitted news racks on an on-going basis. DPW currently requires newspapers obtain permits to install newsracks and operates an on-going program to cite and remove non-permitted vending machines. The City provides guidelines for the location and size of newsracks, but does not dictate exact locations.



Figure 17. Ped-Mount Newsrack in San Francisco

Additionally, DPW runs a Pedestal Mounted Newsrack (or “ped-mount”) Program which provides consolidated newsracks for multiple newspapers. Under this program, the City designates an area as a ped-mount zone. Free-standing newsracks are not permitted in these zones. A contract vendor installs the ped-mounts at no cost to the City, and recoups the costs through advertising contracts.

Garbage cans and other street furniture should be relocated when ped-mounts are installed.

Benefits

- Reduces obstacles for pedestrians, increasing the effective sidewalk width.

Impacts

- None.

Upgraded and Repaired Sub-Sidewalk Elevator Doors

The purpose of this alternative is to increase pedestrian safety by reducing the potential for tripping and slipping accidents.

Building owners would be requested to repair their sub-sidewalk elevator doors to ensure that they are flush with the sidewalk and have effective traction. Examples of these types of improvements include replacing elevator doors, repaving the sidewalk, and/or applying traction tape or a non-skid coating to the doors.

Many sub-sidewalk elevator doors in the study area are in relatively poor condition. The tread on the doors is often worn down, creating a slippery walking surface, particularly when wet. Several



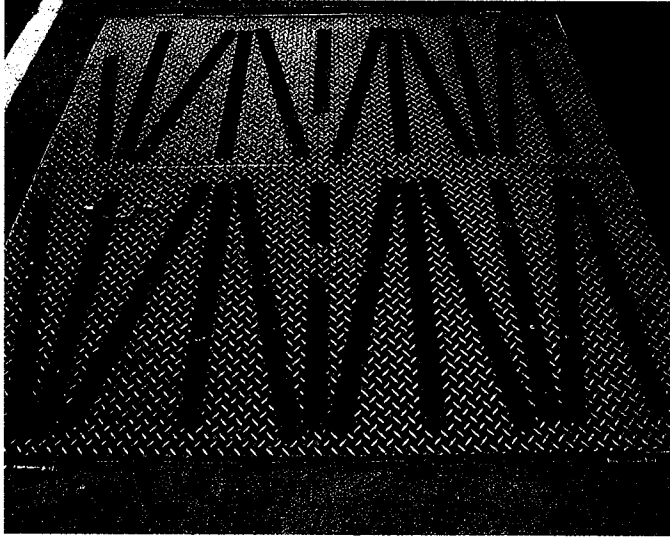


Figure 18. Example of Tread Tape on Sub-Sidewalk Elevator Doors

of the doors are no longer flush with the sidewalk, resulting in an uneven walking surface that can cause tripping.

Upgrades and repairs to sub-sidewalk elevator doors on Stockton Street would require cooperation and support from building owners and merchants. In some cases, adhering traction tape or applying a non-skid coating system may be sufficient. In others, the doors may need to be replaced. In cases where the sidewalk may need to be repaved, this effort should be coordinated with other changes to the street, such as the installation of bulb-outs, the widening of sidewalks, or the creation of a delineated pedestrian walkway.

Benefits

- Improves pedestrian safety.

Impacts

- Imposes costs of improvements on merchants and building owners.

Modified Bus Shelters

The purpose of this alternative is to reduce obstacles to MUNI passengers waiting to board buses, improving the orderliness of bus boarding and alighting, and increase the effective sidewalk width.

Existing bus shelters on Stockton Street have solid rear and side walls, which limit the mobility of pedestrians waiting to board buses. Existing shelters would be replaced with new shelters without rear or side walls, enabling passengers to pass through shelters to access buses. Several different designs are available; shelters without rear or side walls can be designed with large enough canopies to shelter passengers from rain.



Figure 19. Example of a Modified Bus Shelter

Benefits

- Provides more space for waiting passengers.
- Improves orderliness of bus boarding and alighting, reducing boarding times.
- Reduces obstacles to pedestrian movement and increases effective sidewalk width.

Impacts

- Reduces the amount of advertising space on shelters.
- Provides less protection from wind and rain.

Major Roadway Improvements

Four major physical improvement alternatives were developed and analyzed. Each involves changes to roadway geometries and signal timing. They include:

- Option 1: Southbound Bus Queue Jumps
- Option 2: Southbound Bus-Only Lane
- Option 3: Northbound Bus- and Truck-Only Lane
- Option 4A: Widened Sidewalks
- Option 4B: Widened Sidewalks and Traffic Diversion

For the technical analysis, the presence of corner bulb-outs was assumed for each alternative. In the widened sidewalk option, bulb-outs would be installed on side streets but not on Stockton Streets. The traffic and MUNI travel time changes associated with the installation of the corner bulb-outs were analyzed using the CORSIM computerized simulation model. As noted previously, CORSIM is a microscopic simulation model that represents the movements of individual vehicles, including influences of driver behavior, through a street network. Field survey data was inputted into the model for the baseline condition, and changes to the roadway and signal network were entered for each alternative. The results of the technical analysis are presented below and in Appendix C.

For each alternative, a bar graph shows the change in travel time for MUNI buses and all vehicles associated with four scenarios:

- Roadway improvements and bulb-outs;
- Roadway improvements, bulb-outs, and improved double parking enforcement;
- Roadway improvements, bulb-outs, and improved MUNI operations;
- Roadway improvements, bulb-outs, improved double parking enforcement, and improved MUNI operations.



Option 1: Southbound Bus Queue Jumps

The purpose of this alternative is to reduce MUNI signal delay in the study area.

This alternative would implement bus queue jumps in the southbound direction and a signal priority system for MUNI buses. Installing queue jumps would require the conversion of one southbound lane to a bus-only lane from each of the three southbound bus stops to the downstream intersection. Figure 20 shows the locations of the bus queue jumps.

Signals at intersections along Stockton Street between and including Sacramento and Broadway would be modified to grant priority to MUNI buses by installing a semi-actuated or actuated signal control at intersections in conjunction with a bus sensor device (e.g. a tube under the street, a video camera, or an electronic signal device). Upon detecting a bus, the signal controller would skip its programmed cycle order to give the bus priority. Depending on the signal controller logic, either the total cycle length would be extended or the additional green time for Stockton would be deducted from the green time for the cross street. This could result in increased delays for MUNI's 1-California line on Sacramento and Clay Streets.

Additionally, regulating the use of the queue jumps, which would be designed as short bus and right turn-only lanes, poses enforcement challenges. The use of the queue jumps by other vehicles would erode travel time savings for MUNI. Installing colored or textured pavement could improve visibility and enforcement of the queue jumps.

Figure 21 shows the changes in travel time associated with Option 1.

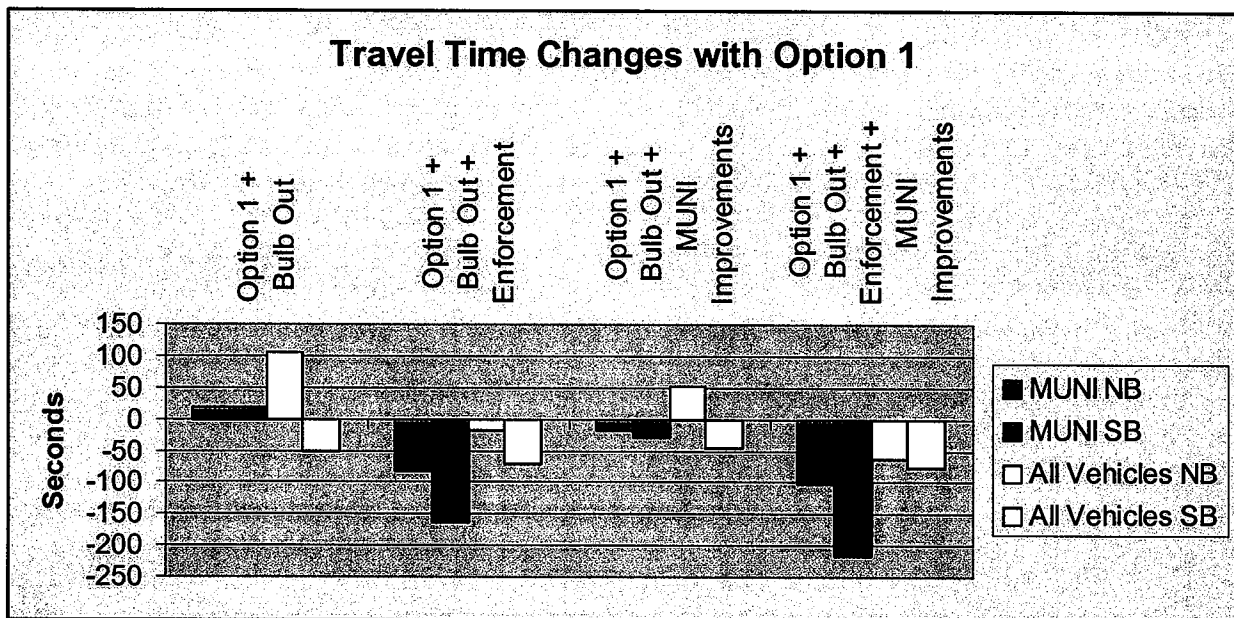
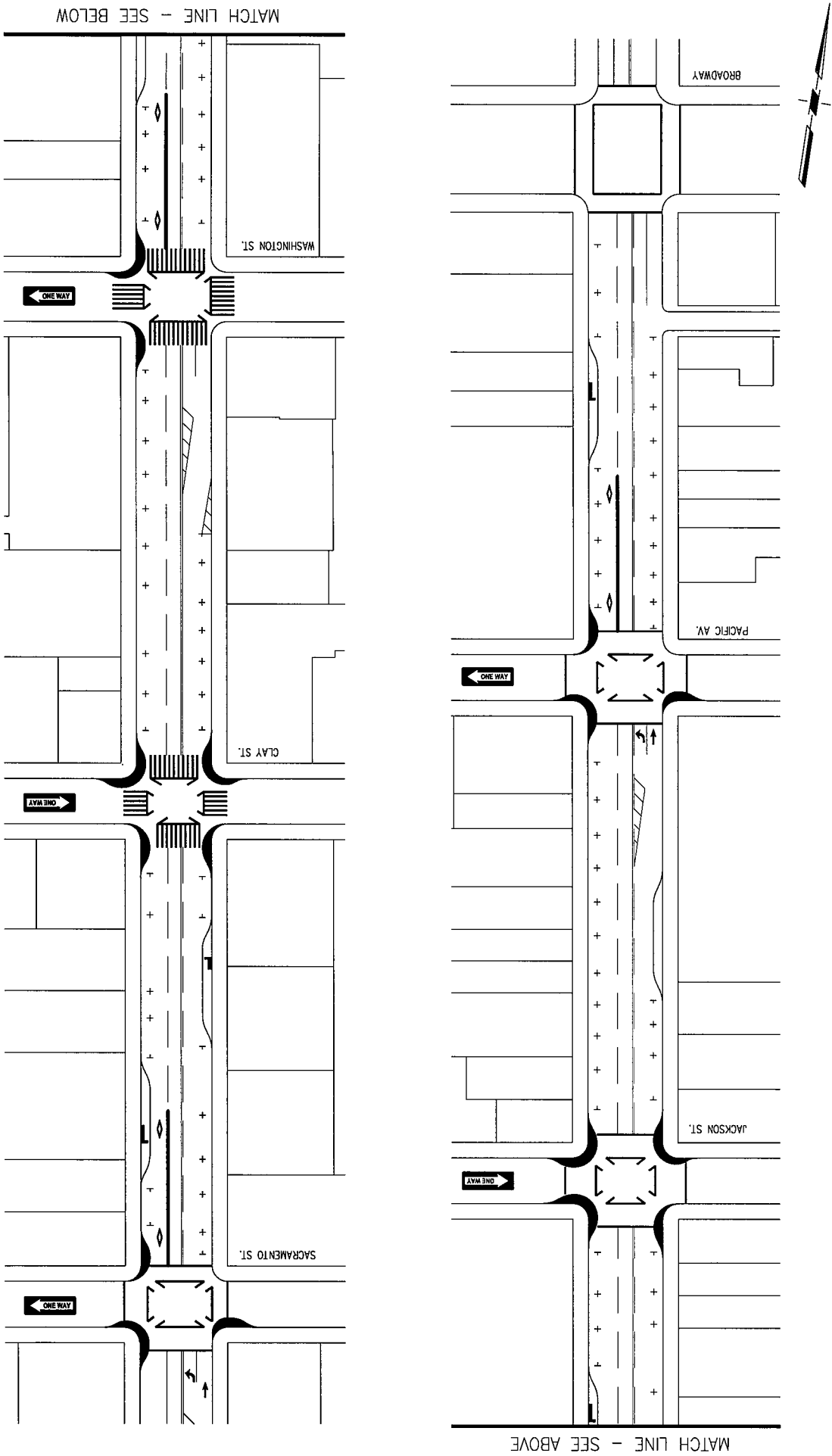


Figure 21. Travel Time Changes with Option 1: Southbound Bus Queue Jumps



Benefits

- Improves travel times for MUNI and other vehicles when installed in conjunction with improvements in double parking enforcement and MUNI operations.
- Double parking enforcement improvements generated the most significant benefits.

Impacts

- Increases travel times for MUNI and other vehicles if implemented only with bulb-outs and without enforcement and operational improvements, with the exception of southbound vehicles, which would experience some savings in travel time.

Option 2: Southbound Bus-Only Lane

The purpose of this alternative is to improve MUNI running times in the southbound direction between Broadway and Sacramento Street.

This alternative would convert one of the southbound lanes on Stockton Street from Broadway to Sacramento to a bus-only lane. If the right traffic lane were converted to a bus-only lane, vehicles making right turns would be permitted to use the bus lane. If the center lane were converted to a bus-only lane, an option that has been suggested by MUNI staff, buses would be able to bypass traffic queues, but southbound left turns would be prohibited. This alternative is illustrated in Figure 22.

Figure 23 shows the changes in travel time associated with this option.

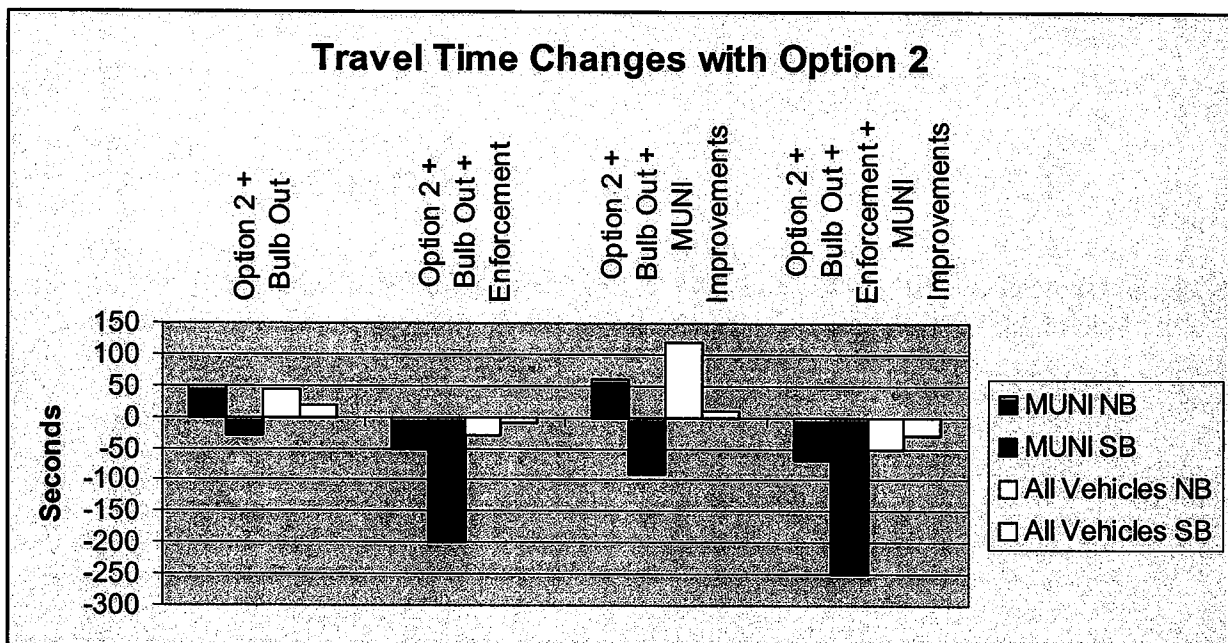
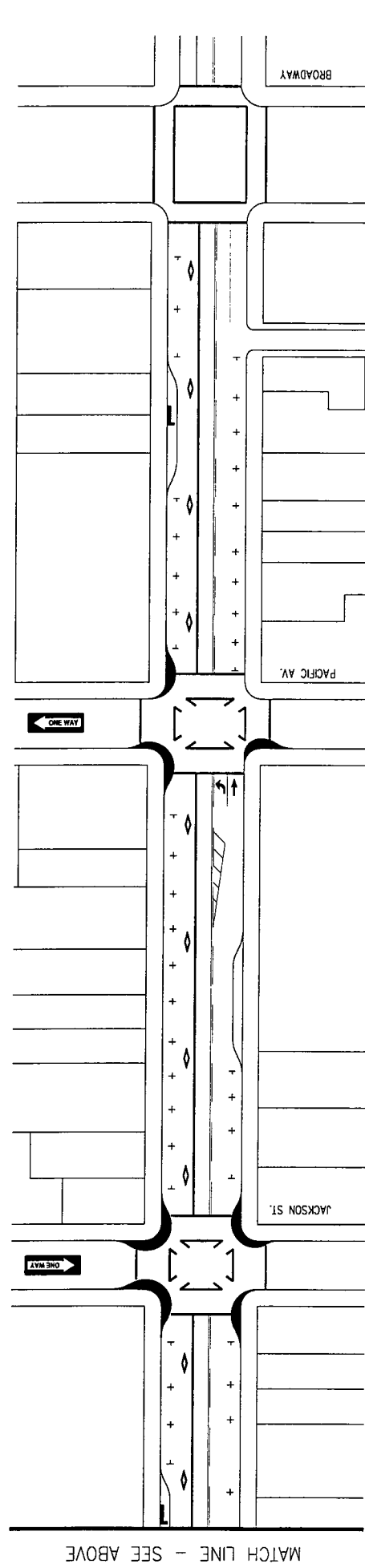
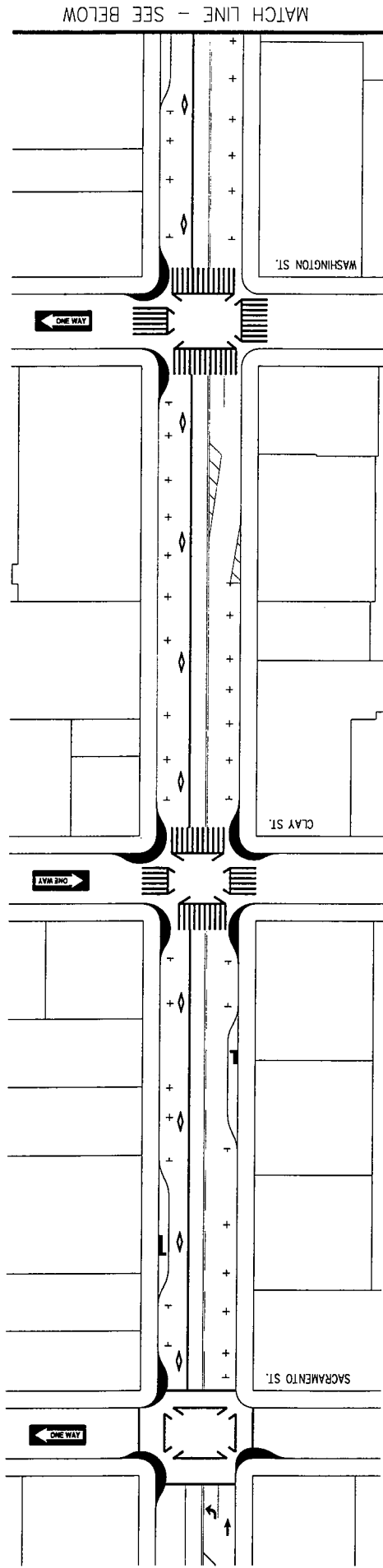


Figure 23. Travel Time Changes with Option 2: Southbound Bus-Only Lane



Stockton Street Enhancement Project

CHS Consulting Group



Figure 22

Option 2: Southbound Bus-Only Lane

Benefits

- Improves travel times for MUNI and other vehicles when combined with improvements in double parking enforcement and MUNI operations.
- Double parking enforcement improvements generated the most significant benefits.

Impacts

- Requires drivers who currently make left turns from Stockton in the southbound direction to use alternative routes. Drivers might travel around the block or use Powell Street. Detailed origin and destination data are required to quantify the impacts associated with this change. Currently, approximately 120 vehicles turn left from southbound Stockton Street during the PM peak hour, and approximately 100 vehicles make left turns in the AM peak hour.
- Increases travel times for MUNI and other vehicles if implemented without improvements in double parking enforcement, with the exception of southbound MUNI travel times, which improve in all cases. Continued double parking will increase MUNI travel times because the queue that develops at red lights could extend beyond mid-block bus stops; double-parked cars will prevent buses from maneuvering into the second southbound lane. Currently, vehicle queues rarely extend past mid-block stops in both lanes.

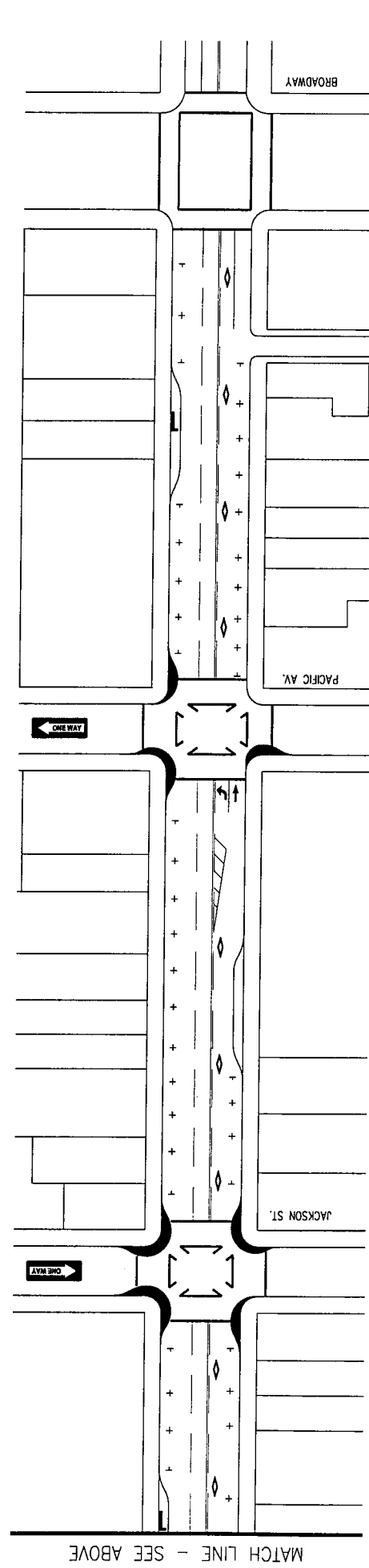
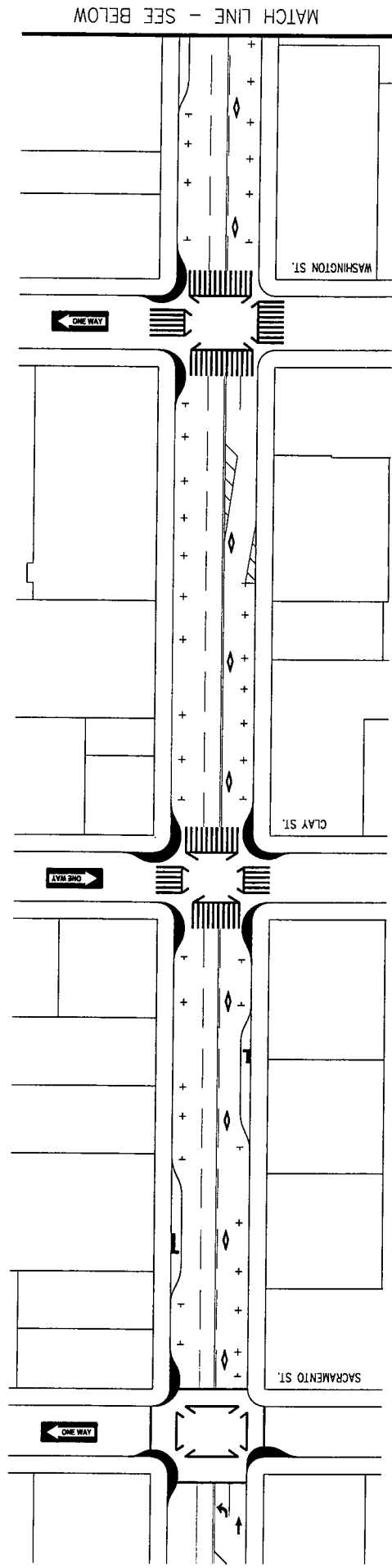
Option 3: Northbound Bus- and Truck-Only Lane

The purpose of this alternative is to improve MUNI running times in the northbound direction between Sacramento Street and Broadway.

This alternative would limit northbound access on Stockton Street between Sacramento and Broadway to buses and trucks only. All other northbound vehicles would be diverted from Stockton. Sansome Street currently operates with a similar configuration as a one-way street with a MUNI contra-flow lane. Figure 24 illustrates this alternative for the study area.

Figure 25 shows the travel time changes associated with this option.





Stockton Street Enhancement Project



Figure 24
Option 3: Northbound Bus and Truck only Lane

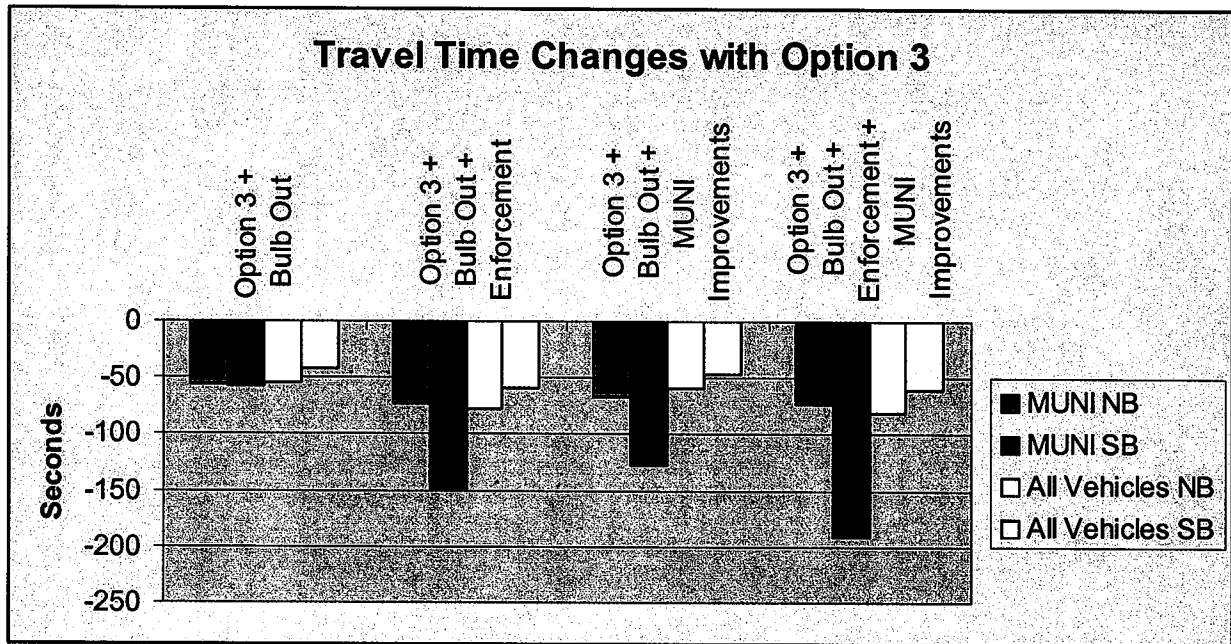


Figure 25. Travel Time Changes with Option 3: Northbound Bus- and Truck-Only Lane

Benefits

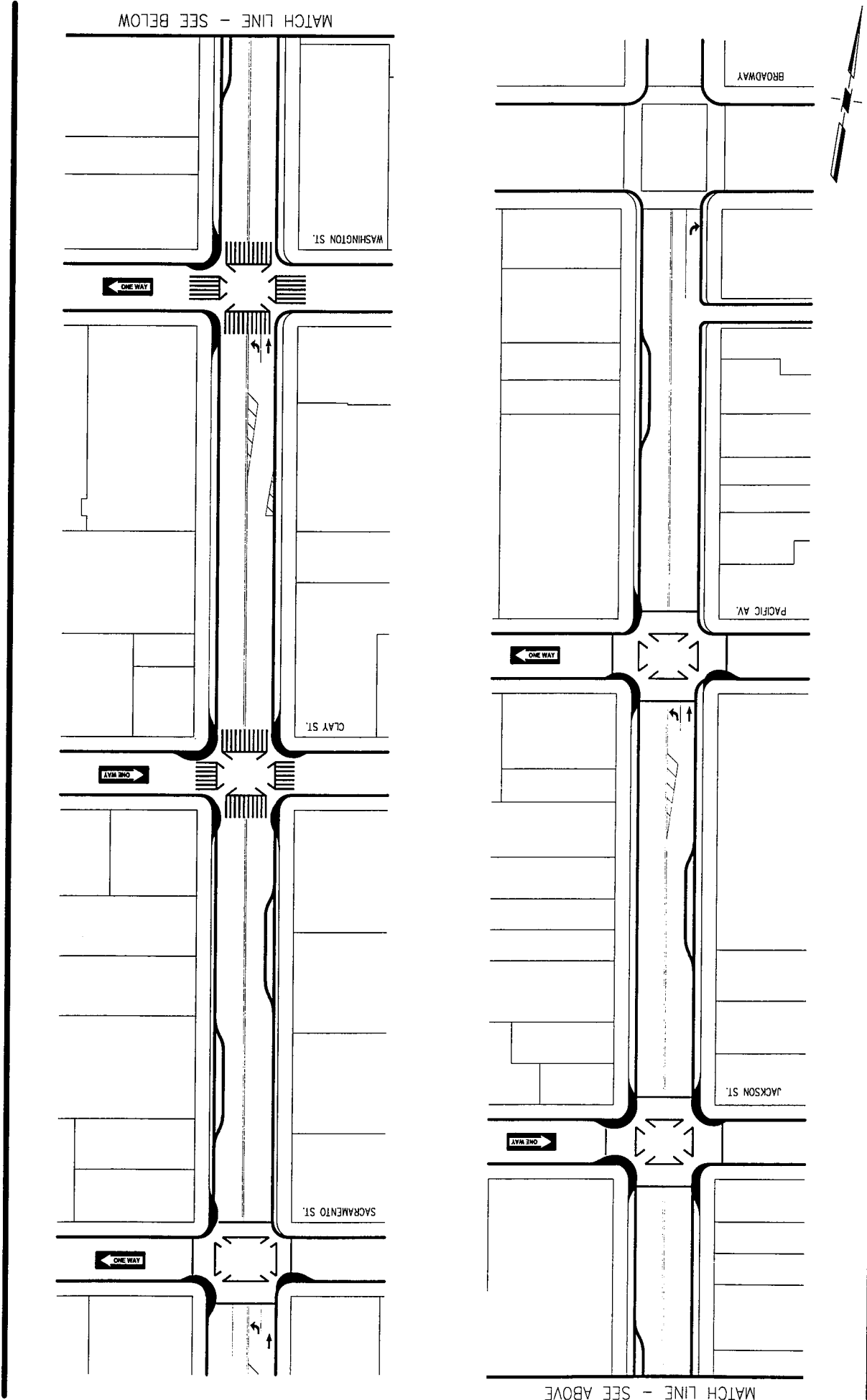
- Improves travel times for MUNI and other vehicles. The travel time savings are accrued regardless of the presence of enforcement or MUNI improvements.
- Double-parking enforcement improvements generated the most significant benefits.

Impacts

- Poses operational challenges and could result in adverse impacts to other streets. A more detailed analysis including an understanding of the origins and destinations of drivers currently using Stockton Street is needed to develop an appropriate rerouting plan.
- Reduces access to buildings on the east side of Stockton for passenger drop-off, which could be particularly problematic for the elderly and disabled.
- Poses enforcement challenges, especially for vehicles dropping off passengers.

Option 4: Widened Sidewalks

The purpose of this alternative is to increase sidewalk widths. In this alternative, the roadway configuration on Stockton Street between Sacramento Street and Broadway would be changed to resemble Stockton between Broadway and Columbus Avenue. Sidewalks would be widened to approximately 13 to 15 feet on both sides of the street, eliminating one southbound lane. On-street parking and loading spaces would remain on both sides of the street. Southbound left turns would be prohibited. In this alternative, bulb-outs would be unnecessary on Stockton, but would be installed on side streets. This alternative is illustrated in Figure 26.



Stockton Street Enhancement Project

Widening the sidewalks will become a more attractive option with the completion of the Central Subway project because there will be fewer buses and more pedestrian activity, especially in the proposed terminal area at Stockton and Clay Streets.

Although permits for sidewalk displays limit the depth of displays to two feet, enforcement would be necessary to ensure that merchants do not extend their displays further into the sidewalk area if it is widened.

Figure 27 shows the travel time changes associated with this option.

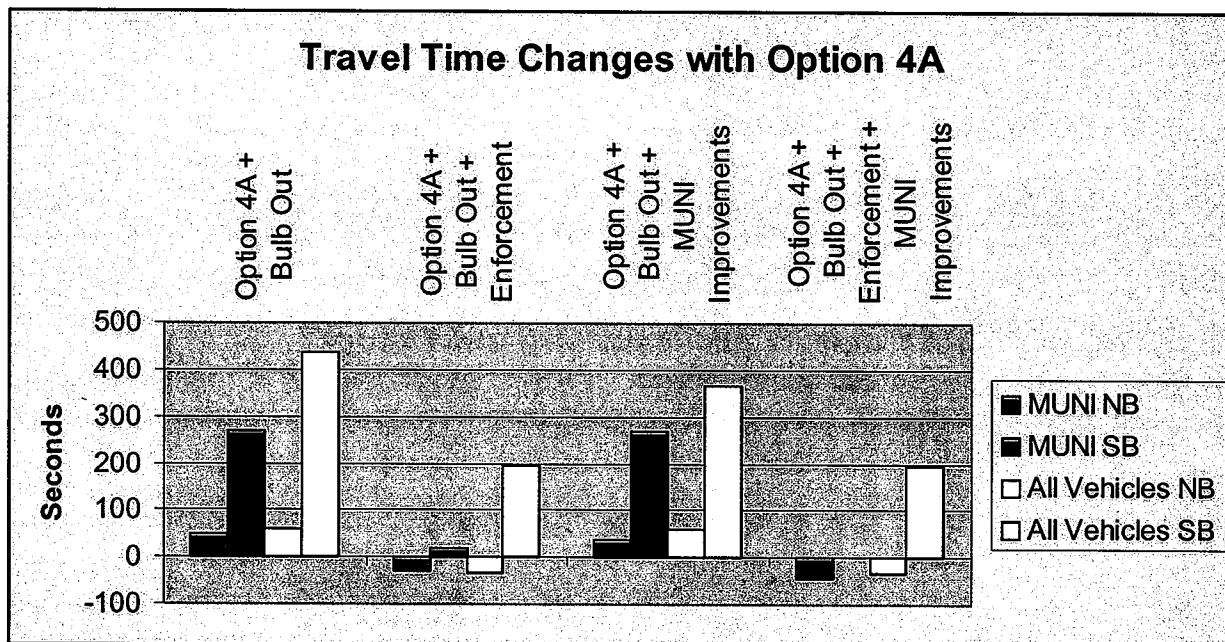


Figure 27. Travel Time Changes with Option 4A: Widened Sidewalks

Benefits

- Increases the effective sidewalk width.
- Double parking enforcement improvements generated the most significant benefits.

Impacts

- Increases travel times without improved double parking enforcement, as a result of eliminating one southbound lane. Even with double parking enforcement, all southbound vehicles, including MUNI buses, will experience nearly doubled travel times. The model analysis shows conditions approaching gridlock for traffic on Stockton and cross streets in the study area.
- Requires southbound drivers making left turns from Stockton to use alternative routes. Drivers might travel around the block or use Powell Street. Detailed origin and destination data are needed to quantify the impacts associated with this change.

Option 4B: Widened Sidewalks with Traffic Diversion

Based on the near-gridlock conditions predicted by the simulation model for Option 4, the model was re-run with a reduction of 200 southbound vehicles in the PM peak hour. These vehicles would be diverted to other streets. Again, southbound left turns from Stockton Street would be prohibited. With this modification, the model predicts travel time improvements in most cases. It is important to note that without forced diversion, actual travel time savings would not occur. In general, drivers seek the fastest path between their origin and destination. When travel times through a given corridor improve, drivers will use that route unless they are prohibited from doing so. As a result, traffic volumes will remain high, and travel times will not generally improve. Only through forced diversion will travel times be reduced in the field.

If 200 southbound vehicles were diverted away from Stockton Street in the PM peak hour, many would likely use Powell and Montgomery Streets. However, as origin/destination pair data are not currently available, it is not possible to quantify these predictions.

Figure 28 shows the travel time changes associated with this modification to Option 4.

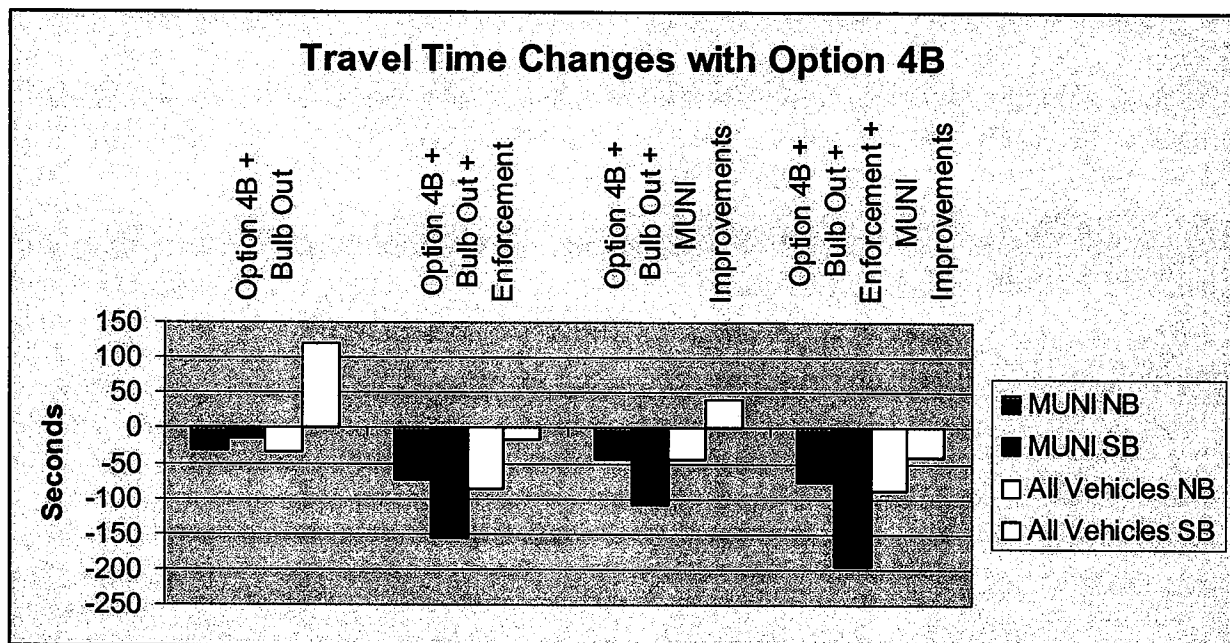


Figure 28. Travel Time Changes with Option 4B: Widened Sidewalks with Traffic Diversion

Benefits

- Increases the effective sidewalk width.
- Double parking enforcement improvements generated the most significant benefits.

Impacts

- Adversely impacts traffic operations on other streets. A more detailed analysis including an understanding of the origins and destinations of drivers currently using Stockton is necessary to develop an appropriate diversion plan.
- Negatively impacts travel times for MUNI and other vehicles if the diversion is not effective.



6.0 PREFERRED ALTERNATIVES

This section describes the preferred alternatives chosen in community meetings for further study and implementation. The preferred alternatives are presented by phase and implementation strategies for each improvement are also outlined.

6.1 Phase One Improvements

The solutions listed below are recommended as Phase One Improvements. They can be approved and implemented quickly, and the costs associated with each are relatively low.

Management Improvements

Improved Enforcement by City Departments and Divisions

The Stockton Street Commercial Corridor Group has taken the lead on developing a more effective enforcement strategy for Stockton Street. The group holds on-going meetings with City departments to develop a balanced plan that can be implemented. SSCC will also be well-positioned to provide on-going oversight for the effectiveness of the program after its implementation.

Parking Meter Enforcement Seven Days a Week

Enforcing parking meters seven days a week from 7:00 AM to 6:00 PM would require DPT to change parking signage and the affected meters (including the new Reino meters), and enforce regulations on Stockton Street on Sundays. Due to budgetary concerns, it is likely that Sundays would be covered as a new beat with straight pay hours, rather than as an overtime assignment.

Physical Improvements

Delineated Pedestrian Walkway

There are several ways to delineate the pedestrian walkway within the sidewalk. One is to simply paint lines on existing sidewalks to demarcate where merchant displays are allowed, where the pedestrian clear pathway is, and where street furniture and utilities are allowed. The cost of this option is approximately \$10 per square foot if thermal plastic is used to paint the sidewalk markings, and less if standard paint is used. However, thermal plastic is recommended as it is more durable. A second option is to repave sidewalks with a pigmented concrete to delineate the pedestrian walkway area. The cost of repaving is substantially higher, but would result in a more permanent and aesthetically pleasing pedestrian environment. The cost of demolishing existing sidewalks is estimated at \$2 per square foot. Grading sidewalks costs approximately \$0.25 per square foot, and



laying reinforced concrete treated with pigment costs approximately \$8 per square foot. These estimates are based on a recent project completed in the City of Novato and are subject to change.

Lower-cost projects could also be developed to delineate the locations for permitted sidewalk merchandise displays, rather than the pedestrian walkway. For example, small markings could be painted on the sidewalk that outline the corners of the permitted sidewalk displays. The costs associated with this program could be incorporated into the permit fee structure.

The recommendations in this report is conceptual in nature. The details of these programs would need to be worked out between DPW and building owners and merchants with regards to design, funding, and maintenance.

Corner Bulb-Outs

Installing corner bulb-outs would cost approximately \$345,000 and would be carried out by DPW. The final design of the bulb-outs would require review and approval from both DPT and DPW.

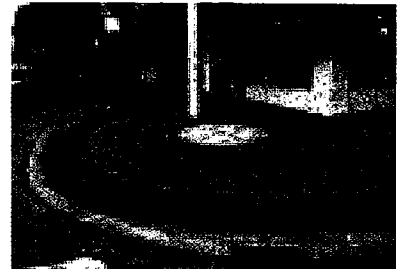


Figure 29. Example of a Corner Bulb-Out

Standardized Diagonal Crossing Striping

Repainting crosswalks on Stockton at Sacramento, Clay, Washington, Jackson, and Pacific will cost \$10 per square foot if thermal plastic is used. Typically, crosswalk lines are 12 inches in width. DPT's striping unit would implement this improvement.

The cost of restriping the three intersections without zebra stripes is approximately \$2,300 per intersection (230 square feet of thermal plastic at \$10 per square foot). The actual costs would vary depending on the width of each street after the bulb-outs are implemented. For the two intersections with zebra stripes, the cost per intersection is approximately \$10,300 (1,030 square feet of thermal plastic at \$10 per square foot).

Bi-Lingual Pedestrian Crossing Signs

This improvement would add four new signs at each of the intersections with scramble signals (Sacramento, Clay, Washington, Jackson, and Pacific). DPT's sign shop would implement this improvement measure. The cost depends on the size, design, and number of variations.



Figure 30. Existing Bi-Lingual Scramble Intersection Sign

Scramble Signal at the Sacramento Street Intersection

The cost of installing pedestrian signal heads at the Sacramento intersection is estimated at \$5,000, which includes hardware, signage, striping, and signal re-timing costs. No major re-wiring is assumed under this cost estimate. DPT would implement this improvement.

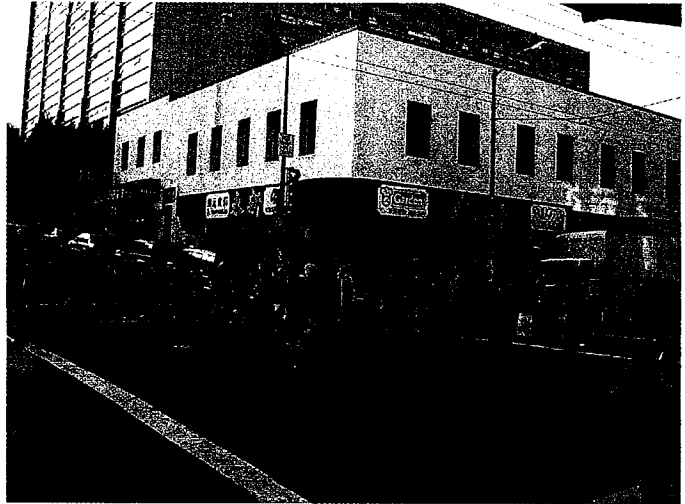


Figure 31. Pedestrian Scramble Signal at a Stockton Street Intersection

Consolidated Street Furniture

CCDC would work with DPW to establish a “Fixed Pedestal Zone” on Stockton Street. As stated in the *Municipal Code Article*

5.4: Regulation of Newsracks, fixed pedestal zones “generally shall be established only in areas of the City which have one or more of the following: extensive public transit service, usage, and/or facilities; large concentrations of freestanding newsracks; or large numbers of pedestrians.”⁹ The study area meets all of these criteria. The Director of DPW may designate an area as a “Fixed Pedestal Zone” after consultation with the Newsrack Advisory Committee and after completing a survey of the proposed area.

The costs associated with the implementation of the pedestal-mounted newsracks would be borne by the newsrack vendor.

Upgraded and Repaired Sub-Sidewalk Elevator Doors

Merchants and building owners would be responsible for the upgrading and repair of the sub-sidewalk elevator doors on Stockton Street. The cost of traction tape is approximately \$50. Replacing elevator doors costs range from \$1,500 to \$3,500.

CCDC would be an appropriate administrator of a program to implement this recommendation. Working with DPW, it would identify substandard doors and request building owners or merchants to repair or replace the doors. CCDC could provide information about repair costs and suppliers to merchants and building owners, as well as coordinate efforts to find outside funding sources for the program. More extensive repairs would be coordinated with DPW sidewalk improvement plans.

⁹ San Francisco Municipal Code, Article 5.4 Regulation of Newsracks, Section 184.12. (f) (3) (A) (i).

6.2 MUNI Improvements

Because some changes to MUNI operations will require more extensive operational analyses, recommended MUNI improvements have been separated into three phases. Phase One recommendations could be implemented in the near future, while Phase Two and Three recommendations will require more extensive study and negotiations.

Phase One MUNI Improvements

All-Door Boarding

Rear door boarding of buses has been practiced throughout the City. MUNI management recently began deploying personnel to prevent rear door boarding in order to maintain consistency in boarding policy and practice throughout the system. This new policy requires MUNI to use limited personnel resources for a program that slows transit operations. Further, it is unlikely that enough personnel could be deployed to effectively prevent rear-door boarding throughout the City.

Reversing this new policy will save resources, both in terms of reduced personnel costs and faster running times. Implementing proof-of-payment on Lines 30 and 45 would be a second step to legitimize rear door boarding, which still occurs regularly.

Articulated Buses

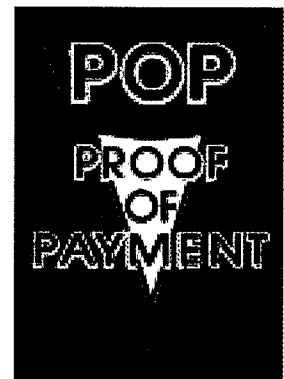
MUNI would continue with its plans to use articulated buses on Route 30. CCDC and SSCC would provide community support and assistance to MUNI as necessary. Possible strategies could include coordinating letter-writing and/or attendance at MUNI's public meetings.

Phase Two MUNI Improvements

Proof-of-Payment

Using a proof-of-payment system would legitimize rear door boarding and make MUNI policy consistent with practice. The cost of implementing the proof-of-payment pilot project for Routes 30 and 45 is approximately \$240,000 per year according to the *Implementation Plan for Proof-of-Payment Fare Collection on MUNI Metro System and Bus Demonstration Program* report of 1998.

The costs of this program result primarily from fare inspection, which could be modified to a lower cost alternative that may result in marginally higher



**Figure 32. MUNI
Proof-of-Payment Logo**

fare evasion rates. Given that rear door boarding is currently a common practice and no fare inspection currently exists, implementing a proof-of-payment program with minimal inspection would likely result in marginal changes in fare evasion rates.

Modified Shelters

The implementation of modified bus shelters requires coordination with MUNI's shelter advertising vendor. Details regarding the size and location of advertising would be negotiated between MUNI and the vendor.

Phase Three MUNI Improvements

Low Floor Buses

AC Transit reports a cost of approximately \$300,000 for each of its newest low floor diesel buses. MUNI should work with bus manufacturers and other agencies that have low floor buses in their fleets to assess the operational feasibility of the buses for routes 30 and 45. Other issues include ground clearance and maintenance.

Shuttle Route

Implementing a shuttle route on Stockton Street may not be necessary if the other MUNI recommendations address the overcrowding problem in Chinatown. If overcrowding continues, a detailed operational study should be conducted to develop an effective and efficient shuttle service. Issues to address include the exact route, schedule, and span of service.

A possible shuttle service could provide eight buses per hour from 8:00 AM to 6:00 PM on weekdays, and 10:00 AM to 6:00 PM on weekends. Providing this level of service would cost approximately \$2.6 million per year. The cost of this service could be offset by reducing the level of service of the northern ends routes 30 and 45.



6.3 Major Physical Improvements

In the selection of a preferred alternative, the community was advised that major physical improvements were mutually exclusive and would require further technical analysis prior to implementation. In some cases, a demonstration project may be an appropriate means of testing the impacts of the changes. Alternatives were ranked by the community in order of preference for further operational and impact analyses.

The community's top priority was to widen sidewalks, followed by MUNI queue jumps or a southbound bus-only lane.

Cost estimates for major physical improvements are included in Appendix D.

6.4 Cost Estimates and Implementation

Table 7 presents order of magnitude capital and operational cost estimates for the various recommended alternatives and lists the departments and agencies that would implement the recommended improvements.



Table 7. Order of Magnitude Costs

Recommendation	Capital Cost	Operating Cost/Year	Responsible Party
Phase One Recommendations			
Improved Enforcement			DPT, DPW, SFPD
Seven Day Meter Enforcement			DPT
Delineated Pedestrian Walkway	\$10 per square foot		Building Owners, Merchants
Corner Bulb-Outs	\$345,000		DPW
Diagonal Crossing Striping	\$27,500		DPT
Bi-Lingual Pedestrian Signage			DPT
Scramble Signal at Sacramento	\$5,000		DPT
Consolidated News Racks	\$0		Ad Vendor
Upgraded & Repaired Sub-Sidewalk Elevator Doors	\$50 for tape \$1,500 - \$3,500 for door replacement		Building Owners, Merchants
MUNI Recommendations			
All-Door Boarding		\$0	MUNI
Articulated Buses	\$0 (assumes already in fleet)	\$0 (assumes already in fleet)	MUNI
Proof-of-Payment	\$135,000 for bus retrofit	\$175,000	MUNI
Modified Shelters	\$0		Ad Shelter Co.
Low Floor Buses	\$300,000 each (cost of AC's newest low floor diesel buses)		MUNI
Shuttle Route	\$300,000 each bus	\$2.6 million (assumes 7.5 minute headways 8:00 AM to 6:00 PM)	MUNI
Major Physical Improvements			
Widened Sidewalks	\$625,000		DPW, DPT
Southbound Bus Queue Jump	\$20,000 (in addition to bulb-outs)		DPT
Southbound Bus-Only Lane	\$30,000 (in addition to bulb-outs)		DPT

Source: CHS Consulting Group



APPENDIX A. PUBLIC WORKSHOP MEETING SUMMARIES

Stockton Street Enhancement Project
Notes from Community Meeting
January 7, 2003 6:00 PM

1. Introduction

Helen Kwan of the Chinatown Community Development Center (CCDC) introduced the team members and provided background on the project. She stated that the purpose of project is to propose improvements to enhance the operation of Stockton Street.

2. Presentation

CHS Consulting Group conducted a slide presentation of existing conditions and survey findings.

3. Question and Answer Session

Speaker - Unknown

The speaker asked why weren't pedestrian counts conducted on Saturday morning and during the weekday evening periods? She stated that her observations show that those are the peak periods for pedestrian activity.

Speaker - Unknown

The speaker stated that the scramble system is inconsistent and confusing.

4. Hands-On Feedback Session

During a break for the hands-on feed back session, community members wrote and indicated on study area maps their areas of concern.

CHS gathered the comments and summarized the issues raised by the participants. The comments were reviewed according to the transportation mode of concern. A list of the comments from the meeting participants is provided below.

Pedestrian

- Ban all sidewalk space from use by merchants
- Crates are a big problem. The solution is enforcement and ticketing.
- Pedestrian monitoring, e.g. crossing guards, would increase pedestrian safety.
- Need to increase crossing time for pedestrians.
- Use more articulated buses on Stockton Street.
- Sidewalk life is a positive thing and the study should not identify as a goal the

improvement of traffic circulation at the expense of pedestrian life.

- Increasing traffic speeds should not be a goal of the project
- Eliminating all vendor stands would hurt the merchants on Stockton Street
- The cost of using sidewalk space is too cheap
- The objective of the study should be improving pedestrian safety. This means minimizing obstacles on the sidewalks.
- Truck deliveries are best before 7 AM. The hours of 7-8 AM are very busy with school buses and deliveries. This results in too many large vehicles on Stockton Street.
- Merchants close during the evening rush hour and this compound traffic congestion.
- Garbage is not always collected from streets. Participant would like to fine for excess garbage generation.
- Close Stockton to traffic and open 24 hours shopping street.

Transit

- Run more articulated buses.
- Move the #30 to Powell Street.
- Create lines or other control methods for boarding buses. Need to create more orderly boarding.
- Create tow-away zones in the morning and the evening rush hours to increase bus speed.
- Somehow need to solve the overcrowding issue.
- Run buses more frequently.
- Create a shorter shuttle route.
- Limit the number of people that can board a bus.

Traffic

- Stockton Street needs more traffic officers.
- Slower vehicle speeds are better for pedestrians.
- Increasing vehicle speeds should not be the objective of the study.
- Reducing congestion and double parking conflicts is a good objective.
- Don't let merchants use parking spaces for loading and unloading and storing of crates.
- Please get rid of scrambles. The capacity for cars is reduced by scrambles.

Parking and Loading

- Reducing violations has multiple benefits.
- Please create more parking.
- Revisit the allocation of yellow spaces. There is no real demand for yellow spaces.
- Loading schedules should be co-ordinated.

5. Conclusion

The meeting adjourned at 8:15 PM.

Stockton Street Enhancement Project
Notes from Community Meeting
February 11, 2003 6:00 PM

1. Introductions and Presentation

CHS Consulting Group conducted a power point presentation of proposed improvements and alternatives.

2. Question and Answer Session

Speaker - Pius Lee

Regarding Option 4 (Widening Sidewalks), Mr. Lee stated that widening the sidewalks would provide more room for pedestrian circulation.

Mr. Lee stated that wider sidewalks already exist north of Broadway on Stockton Street and that this should be continued south of Stockton Street.

Mr. Lee concluded that this option should be implemented.

Speaker - Mr. Chin, Retired FHA Traffic Engineer

Mr. Chin stated that the number of off-street parking should be increased. Specifically, he stated that the park on Powell Street at Jackson Street could be turned into a parking garage.

Mr. Chin stated that left turns on Stockton delay through movements, especially in the southbound direction at Jackson and Clay. Left turn lanes should be installed at these two intersections.

Mr. Chin stated that an off-street farmers market should be looked into. Right now merchants sell their goods from sidewalk. If there is an off-street market, Mr. Chin said, merchants could sell at the market and get off the sidewalks.

Mr. Chin expressed concern that bulb-outs may not allow enough room for truck turning. He stated that trucks require a 40 foot turning radius and the bulb-outs make the street too narrow.

Mr. Chin expressed concern that the sidewalk widening would reduce the street to one lane in each direction, which he felt would be a hazard for fire trucks as they will not be able to get through traffic.

Mr. Chin suggested that improvements and construction activity need to be co-ordinated. In the past, agencies did their work in succession instead of in tandem. He said that this resulted in unnecessary disruption to the street.

Mr. Chin stated that the Broadway tunnel is closed during Chinese New Year. He said that the tunnel should be closed all the time.

Mr. Chin suggested that truck size should be restricted on Stockton Street.

Mr. Chin suggested that the supply of affordable off-street parking should be increased.

Mr. Chin noted that MUNI LRT will soon be implemented. He expressed concern about how the construction activity would affect traffic. He stated that the community should be made aware of the construction period impacts.

Speaker - Daniel Hom, DPW Engineer

Mr. Hom stated that the widths of streets and other dimensions should be shown on plans.

Mr. Hom noted that bulb-outs will reduce the number of parking spaces available and make it difficult to get out of spaces adjacent to bulbs.

Mr. Hom suggested that permanent truck parking should be prohibited in front of shops. (He later clarified that long-term truck parking, i.e. non-active loading, should be prohibited.)

Mr. Hom stated that displays of merchandise should be prohibited on the 2-feet nearest the curb edge.

Mr. Hom said that all door loading would delay boarding times if someone is found 'cheating' and must exit the bus and re-enter at the front door.

Speaker - Mr. Chin, second time

Mr. Chin suggested that BART should be subsidized 100 percent, making it free for riders.

Mr. Chin said that the proposed bus loop should be shortened even more and made free. He thought that the reductions in operating costs would make up for the loss in fare revenues. He said that people using this loop would likely transfer to another line or to BART anyway, so fares would be collected then.

Speaker - Resident at Washington/Powell

The resident said that scramble intersection markings should be more visible to drivers. He suggested using a different color paint or zebra crosswalks.

The resident has noticed that there has been an officer patrolling Stockton Street recently and comments that this has been very effective and would like this to continue.

Speaker - Will Dinh, member of TRIPS

Mr. Dinh stated that bulb-outs are a good idea.

Mr. Dinh stated that the Sacramento and Stockton Street intersection scramble signal is a good idea. He suggested that a scramble signal should be installed at Vallejo and Stockton Street as well.

Mr. Dinh stated that he would like to know if a scramble signal at the intersection of Broadway and Stockton Street would be feasible.

Speaker - Mr. Choy

Mr. Choy stated that he thought Pius Lee's comment on wider sidewalks was good, and that widened sidewalks are a good idea.

Mr. Choy questioned the purpose of a bus bulb. He said that buses block traffic when stopped at a bulb.

Mr. Choy stated that trucks are required for business. He said that they should not be prohibited, but restrict them to the hours between 10 PM and 10 AM.

Mr. Choy stated that a new parking garage was needed.

Speaker - Bernard, works in Chinatown

Bernard stated that he supports City's efforts in the areas of parking and loading.

Bernard stated that he believes that most 'real' deliveries are very short in duration. He said that the problem is that merchants park all day in loading zones, thus forcing 'real' delivery trucks to double park. He suggested that enforcement efforts to prevent parking abuse in yellow spaces would solve this problem. He said he realizes this would require merchant cooperation.

Speaker - Name Unknown

The speaker said that widening the sidewalks is a good idea.

The speaker stated that narrow sidewalks are a safety hazard.

The speaker said that deliveries should be made before 8 AM.

The speaker said that enforcement of permits is required.

Speaker - President of Consolidated Chinese Benevolent Society

The speaker said that trucks unload all day and block traffic. He requested that the city set a time for them to load and unload.

The speaker noted that after unloading, merchants leave boxes on the sidewalks for extended periods of time.

The speaker noted that there are City personnel directing traffic and people during big events, and that this activity should be continued.

Speaker - Pauly, works in Chinatown

Pauly noted that the presence of merchandise on sidewalks induces people to walk in street.

Pauly stated that people selling merchandise such as fish from parked vehicles are a danger to consumers and pedestrians.

3. Conclusion

Meeting adjourned at 8:00.

**Stockton Street Enhancement Project
Notes from Community Meeting
March 18, 2003 6:00 PM**

1. Introductions

Helen Kwan of the Chinatown Community Development Center introduced the meeting.

2. Presentation of Phase 1 Improvements

CHS conducted a power point presentation of proposed solutions and analyses of each proposal. A list of improvements by type and mode is provided below.

Phase 1 Improvements include short-term proposals. Short-term improvements are defined as those that can be implemented quickly and at relatively low cost.

- a. Improved enforcement
- b. Delineation of pedestrian walkway
- c. Corner bulb-outs
- d. Standard diagonal signal crossing striping
- e. Larger bilingual signs at crosswalks
- f. Scramble signal at intersection of Stockton and Sacramento Streets
- g. Consolidate street furniture

3. Comments on Phase 1 Improvements

The following comments and responses were provided for the Phase 1 Improvements:

Speaker - Name Unknown

The speaker suggested that the newsracks in front of the Post Office should be eliminated or moved.

Speaker - Pius Lee

Mr. Lee endorsed all Phase 1 improvements.

Speaker - Will Dihn

Mr. Dihn asked if there were any assurances that trucks would not hit pedestrians standing on the edge of a bulb-out, as truck drivers might not be cognizant of people standing there.

Response: Bulb-outs can be designed with bollards and an education program can be implemented.

Speaker - Name Unknown

The speaker said that merchants build their stands all the way to the corners of the buildings, which sometimes limits the space on corners for people to stand. The speaker suggested that merchants should not be allowed to do this.

4. Solicitation of Endorsement or Objection

A vote was taken to endorse or object to the Phase 1 Improvements. The improvements were endorsed with the following objections and/or comments:

Speaker - Name Unknown

The speaker stated that having parking meters in effect seven days a week would discourage people from going to Chinatown. Therefore, this proposal should not be implemented.

5. Presentation of MUNI Improvements

CHS conducted a power point presentation for the following proposed MUNI improvements:

- a. All door boarding
- b. Shorter distance routes, such as a shuttle
- c. Modified Shelters
- d. Low-floor buses
- e. Articulated buses
- f. Proof-of-Payment

6. Comments and Responses to MUNI Improvements

Speaker - Name Unknown

The speaker stated that MUNI already has a plan to run articulated buses on Stockton Street. The speaker stated that articulated buses should be used on a shuttle route, and a shuttle route is not needed all the way to Van Ness Avenue.

Response: MUNI has stated that they require two layover points for each route, and thus the shuttles would have to run to Van Ness Avenue.

Speaker - Name Unknown

The speaker said that all door boarding is inconvenient if someone boards from the back door and then has to move to the front of the bus in order to pay.

Response: Only those people with passes or transfers can use the back door to board.

Speaker - Name Unknown

The speaker asked that service not be reduced on the 30-Stockton route, as this would harm people on Chestnut Street and in the Marina.

Response: Reducing service in a corridor with less demand in order to increase service in a corridor with high demand is a trade off that we may have to make.

Speaker - Name Unknown

The speaker asked if articulated buses could be used only during peak periods. He states that during non-peak periods, articulated buses are not needed, and would result in more traffic congestion.

The speaker stated that modified bus shelters would not provide protection during rain storms.

Response: There are no real peak times for MUNI in the Stockton Street corridor, as ridership is high throughout the day. Bus shelters can be designed with a wide canopy, but would not protect passengers from the rain during windy storms.

Speaker - Will Dihn

Mr. Dihn asked that the meeting participants endorse the proposals and let MUNI work out the details.

7. Solicitation of Endorsement or Objection

The meeting participants endorsed the proposed MUNI improvements.

8. Presentation of Major Physical Improvements

CHS made a power point presentation of the proposed Major Physical Improvements.

- a. Queue jump in the southbound lane with signal priority
- b. Southbound bus only lane
- c. Northbound bus and truck only lane
- d. Widen sidewalks

CHS stated that the analysis does not definitively indicate which alternative is best. Instead of recommending one alternative, the proposal is to rank the alternatives and ask that a temporary test program of the highest-ranked alternative be conducted to ascertain its effects.

9. Comments and Responses on Major Physical Improvements

Speaker - Name Unknown

The speaker said that the proposal that trucks could make deliveries only during the overnight hours was left out of the presentation, and questioned why this was the case.

Response: The omission of the truck schedule improvement measure was an oversight and will be addressed in the subsequent report.

Speaker - Pius Lee

Mr. Lee emphatically endorses widening the sidewalks.

Speaker - Name Unknown

The speaker endorses widening the sidewalks. He says that the other options have too many constraints in terms of what people cannot do, and assumes, perhaps unrealistically, that people will comply with all traffic regulations under the full enforcement scenario.

10. Ranking of Major Physical Improvement Alternatives

The meeting participants select the Widen Sidewalks option as their first preference, and recommend the Southbound Queue Jump or Southbound Bus Only Lane for further investigation.

11. Conclusion

The meeting adjourned at 8:15 PM.

APPENDIX B. EXISTING ENFORCEMENT JURISDICTIONS AND FINES

Type of Enforcement	Agency Responsible	Current Practice	Contact
Parking Enforcement	Department of Parking and Traffic	<p><u>Beats and Assignments</u></p> <ul style="list-style-type: none"> • There is a PCO (Parking Control Officer) on duty from 6 AM in the Chinatown beats (Stockton between Sacramento and Pacific are in beats 210, 211). • Special emphasis is given to Stockton Street within Chinatown beats. • Stockton is best handled on bicycle • PCOs can either work from vehicles or walk their beats • A separate residential permit officer handles residential parking permit enforcement. • A separate CPO (Community Parking Officer) works the area to educate merchants and motorists. <p><u>Schedules</u></p> <ul style="list-style-type: none"> • PCOs begin at 6 AM (tow-away begins at 7 AM), but most begin at 9 AM. • RCOs begin at 8 AM (area includes Chinatown-Nob Hill) • There is an 11 AM watch that handles late afternoon tow zones and directs traffic downtown. • There are special duty PCOs that handle specific complaints <p><u>Weekend Enforcement</u></p> <ul style="list-style-type: none"> • Saturday Enforcement watch starts at 9 AM. • Saturday beats are larger and staff is smaller. • Currently, there is a PCO assigned to Stockton Street between Sacramento and Columbus on Saturdays. • Truck loading zones are in effect 7 AM to 2 PM M-S. • Saturday enforcement times range from 7 AM to 11 AM and 7 AM to 6 PM. <p>Driveway complaint unit</p>	Linda Lawrence
Traffic Enforcement	Police Department		
Illegal Vendors	Police Department	Currently two beat cops patrolling Chinatown.	

Type of Enforcement	Agency Responsible	Current Practice	Contact
Sidewalk Use	Department of Public Works	<p><u>Display Merchandise</u></p> <ul style="list-style-type: none"> • Display can be placed only on sidewalk in front of the retail establishment applying for permit • Sidewalk in front of the business must be wide enough to maintain a minimum of six feet of pedestrian clearance which must be free of all obstacles (maximum width of display is 2 feet; see Design Guidelines below) • Merchandise must not interfere with curb ramps, building access, driveways, or fire escapes • Displays must conform to all Federal, State, and local laws <p><u>Design Guidelines</u></p> <ul style="list-style-type: none"> • Top of display including stand and merchandise must be at least two feet above sidewalk and top must not be more than 3'10" above the sidewalk • Display must not be more than two feet or 25% of width of sidewalk in front of the business, whichever is less • Display of fruits and vegetables must be covered by an awning, which must extend a minimum of six inches beyond the length and width of the display • Stand must be smooth, non-absorbent, and cleanable <p><u>Application Requirements</u></p> <ul style="list-style-type: none"> • Application must include site plan, display design, and list of merchandise to be displayed • Plan must show stand in relation to six foot minimum pedestrian clear area • Fee of \$100 • Insurance of \$1 million <p><u>Approval Process</u></p> <ul style="list-style-type: none"> • Food displays must be approved by DPH • Public hearing • Fee of \$100 for permit if approved plus an annual \$4.80 per occupied square foot • Permit must be displayed at business 	Clifton P. Wong, Manager of Inspection Services, Bureau of Street- Use and Mapping, DPW (415) 554-5762

Type of Enforcement	Agency Responsible	Current Practice	Contact
Sidewalk Use (continued)	Department of Public Works	<p><u>Responsibilities of Permit Holders</u></p> <ul style="list-style-type: none"> • Permit holder is responsible for ensuring activities stay within approved area • All transactions shall occur inside the retail establishment • Cut fruit, shelled nuts, and other dried fruits are not allowed • All displays shall be removed from sidewalk in accordance with approved time of operation each day • Permit holders must maintain storefront, sidewalk, and cutter • Sidewalks must be washed daily • Shopping carts are not allowed in sidewalk except where clearance is eight feet or more • Active deliveries are not allowed in sidewalk after 10 AM • No garbage may be stored on sidewalk for pick up until after 6 PM on the day prior to pick up • Sidewalks may not be altered without approval of DPW <p><u>Compliance and Penalties</u></p> <ul style="list-style-type: none"> • \$100 for display stands not in compliance with permitted design, with permits not displayed, unclean sidewalks and gutter areas, and for altered sidewalks without approval • \$200 for operation without a valid permit, obstruction of minimum pedestrian clearance, displaying of merchandise different form that inside business, violating operation times, and non-compliance with Federal, State, and local laws • \$750 for repeat offenders • \$1000 a day for every day of un-permitted storage on sidewalks. <p><u>Current Practice</u></p> <ul style="list-style-type: none"> • DPW assigns enforcement officers by zip code. Typically, one inspector looks after multiple zip codes. Chinatown, Northbeach, Fisherman's Wharf, and parts of SOMA are under same inspector. • Inspector does walk through as well as responds to complaints. • Enforcement is conducted seven days a week. In Chinatown, DPW has recently started 4-6 PM focused enforcement. • If a business is cited for violations of its permit three times in one year, their permit is revoked. • Of the 280 issued permits, 168 are in Chinatown. • There is a hotline (554-5810) that takes complaints. There is bi-lingual option on the line. 	Clifton P. Wong, Manager of Inspection Services, Bureau of Street- Use and Mapping, DPW (415) 554-5762

Types of Fines	Fine Amount	Comment	Agency Responsible
<i>Parking</i>			
Unpaid Meter	\$35	Raised from \$30 in Aug 2001	DPT
Parking in Red Zone	\$35	--	DPT
Non-Commercial Vehicle in Yellow Zone	\$50	Raised from \$30 in Aug 2001	DPT
<i>Traffic Violations</i>			
Moving Violation	Varies	--	SFPD
Double Parking	\$50	--	SFPD
Parking in MUNI Zone or Tow Away Zone	\$100	Tow Away Zone must have sign stating hours of enforcement	SFPD
<i>Health and Safety</i>			
Illegal Storage of Boxes/Crates on Sidewalk	\$200 (\$750 for repeat offenders)	--	DPW
Merchandise Displays Stored Outside Permitted Limit (typically 2 feet from shop front)	\$100	--	DPW
Unclean Sidewalks	\$100	--	DPW
Obstruction of Pedestrian Walkway	\$200 (\$750 for repeat offenders)	--	DPW
Using Sidewalk without Permit	\$200 (\$750 for repeat offenders)	--	DPW

APPENDIX C. RESULTS OF CORSIM MODELING OF MAJOR PHYSICAL IMPROVEMENTS

The table below shows the travel times for various scenarios including the existing condition; bulb-outs; bulb-outs and improved enforcement that eliminates double parking; bulb-outs and improved MUNI operations including low floor buses and all-door boarding; and bulb-outs, improved enforcement, and improved MUNI operations.

Travel Time Changes with Corner Bulb-Outs

Corner Bulb-Out	Direction	MUNI		All Vehicles	
		Travel Time	Change	Travel Time	Change
Existing Condition	NB	309		265	
	SB	427		218	
Bulb-Out Only	NB	300	-3%	253	-5%
	SB	427	0%	198	-9%
Bulb-Out + Enforcement	NB	242	-22%	192	-28%
	SB	285	-33%	163	-25%
Bulb-Out + MUNI Improvements	NB	292	-5%	247	-7%
	SB	383	-10%	192	-12%
Bulb-Out + Enforcement + MUNI Improvements	NB	232	-25%	185	-30%
	SB	236	-45%	157	-28%

Source: CHS Consulting Group

As seen in the table, the corner bulb-outs alone reduce travel time in the range of 0 to 9 percent. This small level of improvement may be within the statistical variation for the model, and may not result in observable travel time changes. With enforcement and MUNI improvements, travel times are reduced from 25 to 45 percent.

Travel Time Changes from Option 1: Southbound Queue Jump

Option 1 SB Queue Jump with Bulb-Out	Direction	MUNI		All Vehicles	
		Travel Time	Change	Travel Time	Change
Existing Condition	NB	309		265	
	SB	427		218	
Option 1 +Bulb-Out	NB	327	+6%	370	+40%
	SB	445	+4%	168	-23%
Option 1 + Bulb-Out + Enforcement	NB	227	-27%	247	-7%
	SB	265	-38%	148	-32%
Option 1 + Bulb-Out + MUNI Improvements	NB	292	-5%	318	-20%
	SB	397	-7%	171	-22%
Option 1 + Bulb-Out + Enforcement + MUNI Imp.	NB	206	-33%	202	-24%
	SB	210	-51%	142	-35%

Source: CHS Consulting Group

Travel Time Changes from Option 2: Southbound Bus-Only Lane

Option 2 SB Bus-Only Lane with Bulb-Out		MUNI		All Vehicles	
	Direction	Travel Time	Change	Travel Time	Change
Existing Condition	NB	309		265	
	SB	427		218	
Option 2 +Bulb-Out	NB	359	+16%	309	+16%
	SB	397	-7%	236	+8%
Option 2 + Bulb-Out + Enforcement	NB	258	-16%	236	-11%
	SB	227	-47%	210	-4%
Option 2 + Bulb-Out + MUNI Improvements	NB	370	+20%	383	+45%
	SB	337	-21%	227	+4%
Option 2 + Bulb-Out + Enforcement + MUNI Imp.	NB	242	-22%	214	-19%
	SB	176	-59%	188	-14%

Source: CHS Consulting Group

Travel Time Changes from Option 3: Northbound Bus- and Truck-Only Lane

Option 3 NB Bus/Truck-Only with Bulb-Out		MUNI		All Vehicles	
	Direction	Travel Time	Change	Travel Time	Change
Existing Condition	NB	309		265	
	SB	427		218	
Option 3 +Bulb-Out	NB	253	-18%	210	-21%
	SB	370	-13%	176	-19%
Option 3 + Bulb-Out + Enforcement	NB	236	-23%	188	-29%
	SB	278	-35%	159	-27%
Option 3 + Bulb-Out + MUNI Improvements	NB	242	-22%	206	-22%
	SB	300	-30%	171	-22%
Option 3 + Bulb-Out + Enforcement + MUNI Imp.	NB	236	-23%	185	-30%
	SB	236	-45%	157	-28%

Source: CHS Consulting Group

Travel Time Changes from Option 4: Widened Sidewalks

Option 4A Widened Sidewalk	Direction	MUNI		All Vehicles	
		Travel Time	Change	Travel Time	Change
Existing Condition	NB	309		265	
	SB	427		218	
Option 4A + Bulb-Out	NB	359	+16%	327	+23%
	SB	695	+63%	654	+200%
Option 4A + Bulb-Out + Enforcement	NB	278	-10%	232	-13%
	SB	445	+4%	412	+89%
Option 4A + Bulb-Out + MUNI Improvements	NB	347	+12%	327	+23%
	SB	695	+63%	585	+168%
Option 4A + Bulb-Out + Enforcement + MUNI Imp.	NB	265	-14%	232	-13%
	SB	427	0%	412	+89%

Source: CHS Consulting Group

Travel Time Changes from Option 4B: Widened Sidewalks and Vehicle Diversion

Option 4B Widened Sidewalk and Vehicle Diversion	Direction	MUNI		All Vehicles	
		Travel Time	Change	Travel Time	Change
Existing Condition	NB	309		265	
	SB	427		218	
Option 4B + Bulb-Out	NB	278	-10%	232	-13%
	SB	412	-4%	337	+54%
Option 4B + Bulb-Out + Enforcement	NB	236	-23%	179	-32%
	SB	271	-37%	202	-7%
Option 4B + Bulb-Out + MUNI Improvements	NB	265	-14%	222	-16%
	SB	318	-26%	258	+19%
Option 4B + Bulb-Out + Enforcement + MUNI Imp.	NB	232	-25%	176	-33%
	SB	232	-46%	176	-19%

Source: CHS Consulting Group

APPENDIX D. COST ESTIMATES FOR MAJOR PHYSICAL IMPROVEMENTS

Stockton Street Improvements -- Cost Estimate
Alternative 1 -- Bulbout Only

03/13/03

Item No.	Description	Unit	Unit Cost	Quantity	Extension
1.	Remove Curb & Gutter	L.F.	15	720	\$10,800
2.	Remove Sidewalk	S.F.	4	1120	4,480
3.	Adjust Utility Valve Box	Each	300	11	3,300
4.	Adjust Utility Manhole	Each	1500	1	1,500
5.	Adjust Pull Box	Each	150	12	1,800
6.	Relocate Manhole	Each	5000	1	5,000
7.	Install Curb & Gutter	L.F.	35	1000	35,000
8.	Install Sidewalk	S.F.	15	3520	52,800
9.	Install Curb Ramp	Each	1200	16	19,200
10.	Install Bus Lane Traffic Line	L.F.	3	0	0
11.	Install Bus Lane Legend	Each	200	0	0
12.	Modify Signal Timing - Splits Only	Each	200	5	1,000
13.	Modify Signal Timing - Total Reset	Each	2000	0	0
14.	Relocate Drainage Inlet	Each	8000	13	104,000
	Construction Total				\$238,880
15.	Engineering (20% of construction)	L.S.		1	47,776
16.	Construction Management (5%)	L.S.		1	11,944
	Total				286,656
	Contingency (20%)				57,331
	Grand Total				\$343,987

Quantity Detail							
		Intersection			Midblocks		
Sacramento	Clay	Washington	Jackson	Pacific	Sac. To Bdwyl	Total	
125	180	90	200	125		720	
210	280	140	280	210		1120	
0	5	3	1	2		11	
1						1	
2	4		4	2		12	
1						1	
175	250	125	275	175		1000	
635	880	440	930	635		3520	
3	4	2	4	3		16	
						0	
						0	
1	1	1	1	1		5	
						0	
2	3	2	3	3		13	

03/13/03

Item No.	Description	Unit	Unit Cost	Quantity	Extension
1.	Remove Curb & Gutter	L.F.	15	720	\$10,800
2.	Remove Sidewalk	S.F.	4	1120	4,480
3.	Adjust Utility Valve Box	Each	300	11	3,300
4.	Adjust Utility Manhole	Each	1500	1	1,500
5.	Adjust Pull Box	Each	150	12	1,800
6.	Relocate Manhole	Each	5000	1	5,000
7.	Install Curb & Gutter	L.F.	35	1000	35,000
8.	Install Sidewalk	S.F.	15	3520	52,800
9.	Install Curb Ramp	Each	1200	16	19,200
10.	Install Bus Lane Traffic Line	L.F.	3	500	1,500
11.	Install Bus Lane Legend	Each	200	9	1,800
12.	Modify Signal Timing - Splits Only	Each	200	0	0
13.	Modify Signal Timing - Total Reset	Each	2000	5	10,000
14.	Relocate Drainage Inlet	Each	8000	13	104,000
	Construction Total				\$251,180
15.	Engineering (20% of construction)	L.S.		1	50,236
16.	Construction Management (5%)	L.S.		1	12,559
	Total				301,416
	Contingency (20%)				60,283
	Grand Total				\$361,699

03/13/03

Item No.	Description	Unit	Unit Cost	Quantity	Extension
1.	Remove Curb & Gutter	L.F.	15	720	\$10,800
2.	Remove Sidewalk	S.F.	4	1120	4,480
3.	Adjust Utility Valve Box	Each	300	11	3,300
4.	Adjust Utility Manhole	Each	1500	1	1,500
5.	Adjust Pull Box	Each	150	12	1,800
6.	Relocate Manhole	Each	5000	1	5,000
7.	Install Curb & Gutter	L.F.	35	1000	35,000
8.	Install Sidewalk	S.F.	15	3520	52,800
9.	Install Curb Ramp	Each	1200	16	19,200
10.	Install Bus Lane Traffic Line	L.F.	3	1500	4,500
11.	Install Bus Lane Legend	Each	200	25	5,000
12.	Modify Signal Timing - Splits Only	Each	200	0	0
13.	Modify Signal Timing - Total Reset	Each	2000	5	10,000
14.	Relocate Drainage Inlet	Each	8000	13	104,000
	Construction Total				\$257,380
15.	Engineering (20% of construction)	L.S.		1	51,476
16.	Construction Management (5%)	L.S.		1	12,869
	Total				308,856
	Contingency (20%)				61,771
	Grand Total				\$370,627

**Stockton Street Improvements -- Cost Estimate
Alternative 4 -- Bulbout & NB Trucks/Buses Only**

03/13/03

Item No.	Description	Unit	Unit Cost	Quantity	Extension
1.	Remove Curb & Gutter	L.F.	15	720	\$10,800
2.	Remove Sidewalk	S.F.	4	1120	4,480
3.	Adjust Utility Valve Box	Each	300	11	3,300
4.	Adjust Utility Manhole	Each	1500	1	1,500
5.	Adjust Pull Box	Each	150	12	1,800
6.	Relocate Manhole	Each	5000	1	5,000
7.	Install Curb & Gutter	L.F.	35	1000	35,000
8.	Install Sidewalk	S.F.	15	3520	52,800
9.	Install Curb Ramp	Each	1200	16	19,200
10.	Install Bus Lane Traffic Line	L.F.	3	0	0
11.	Install Bus Lane Legend	Each	200	0	0
11a.	Install Traffic Signs	Each	300	16	4,800
12.	Modify Signal Timing - Splits Only	Each	200	5	1,000
13.	Modify Signal Timing - Total Reset	Each	2000	0	0
14.	Relocate Drainage Inlet	Each	8000	13	104,000
	Construction Total				\$243,680
15.	Engineering (20% of construction)	L.S.		1	48,736
16.	Construction Management (5%)	L.S.		1	12,184
	Total				292,416
	Contingency (20%)				58,483
	Grand Total				\$350,899

Quantity Detail

Sacramento	Clay	Intersection		Jackson	Pacific	Midblocks Sac. To Bdwy	Total
		Washington	90				
125	180			200	125		720
210	280	140		280	210		1120
0	5	3		1	2		11
1							1
2	4			4	2		12
1							1
175	250	125		275	175		1000
635	880	440		930	635		3520
3	4	2		4	3		16
4	2	2		2	2	4	16
1	1	1		1	1		5
2	3	2		3	3		13

**Stockton Street Improvements -- Cost Estimate
Alternative 5 -- Sidewalk Widening (Long Range)**

03/13/03

Item No.	Description	Unit	Unit Cost	Quantity	Extension
1.	Remove Curb & Gutter	L.F.	12	2990	\$35,880
2.	Remove Sidewalk	S.F.	4	420	1,680
3.	Adjust Utility Valve Box	Each	300	0	0
4.	Adjust Utility Manhole	Each	1500	0	0
5.	Adjust Pull Box	Each	150	3	450
6.	Relocate Manhole	Each	5000	0	0
7.	Install Curb & Gutter	L.F.	30	2800	84,000
8.	Install Sidewalk	S.F.	14	13670	191,380
9.	Install Curb Ramp	Each	1200	6	7,200
10.	Install Bus Lane Traffic Line	L.F.	3	0	0
11.	Install Bus Lane Legend	Each	200	0	0
12.	Modify Signal Timing - Splits Only	Each	200	0	0
13.	Modify Signal Timing - Total Reset	Each	2000	5	10,000
14.	Relocate Drainage Inlet	Each	8000	4	32,000
14a.	Misc. Utility Adjustment Allowance	L.S.	20000	1	20,000
	Construction Total				\$382,590
15.	Engineering (20% of construction)	L.S.		1	76,518
16.	Construction Management (5%)	L.S.		1	19,130
	Total				459,108
	Contingency (20%)				91,822
	Grand Total				\$550,930

Quantity Detail						
Sacramento	Intersection			Midblocks Sac. To Bdwyl	Total	
	Clay	Washington	Jackson			Pacific
110	80	110	80	110	2990	
140	0	140	0	140	420	
0	0	0	0	0	0	
0					0	
0	0	1	0	2	3	
0					0	
100	0	100	0	100	2800	
390	0	390	0	390	13670	
2	0	2	0	2	6	
					0	
					0	
					0	
					0	
1	1	1	1	1	5	
1	0	1	0	2	4	

Notes:

1. Corner Bulbouts under Alternative 1 are assumed to be already installed.
2. Unit costs of curb/gutter and sidewalk work are reduced to account for larger quantities under this alternative

GLOSSARY

Source: Mineta Transportation Institute, Highway Capacity Manual Glossary of Traffic Terms, Institute of Transportation Engineers

Actuated Signal:	A signal where the length of the phases of different traffic movements is adjusted for demand by a signal controller using information from detectors.
Alighting:	Term used to describe passengers departing or leaving a transit vehicle.
Articulated Bus:	A bus usually 55 feet or more in length with two connected passenger compartments that bend at the connecting point when the bus turns a corner.
Beat:	The area repeatedly covered by and assigned to an enforcement officer.
Bulb-Out:	A section of sidewalk at an intersection or midblock location that extends into the roadway, generally to narrow the crossing distance at an intersection or provide a larger queuing area at a bus stop. Another term for a curb extension.
Bus Bulb:	A bus stop which extends the sidewalk into the street to enable buses to remain in traffic lanes to serve passenger. Bus bulbs tend to improve passenger safety and mitigate sidewalk congestion at heavily used bus stops.
Bus Loading Platforms:	Extensions of the sidewalk into the street which provide additional queuing area at a bus stop.
Conflict:	A collision or near-collision which requires evasive action on the part of one or more persons. Conflicts generally occur between two motorists, between a motorist and cyclist, between a motorist and pedestrian, and between a cyclist and pedestrian.
Contraflow Lane:	Reserved lane for buses on which the direction of bus traffic is opposite to the flow of traffic on the other lanes.
Corridor:	A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments.
Cycle:	When referring to a traffic signal, cycle describes one complete sequence of signal indications.
Destination:	The point at which a trip ends.

Double Park:	To park alongside another vehicle already parked parallel to the curb.
Downstream:	The direction of traffic flow.
Dwell Time:	The time a vehicle or train is allowed to discharge and take on passengers at a stop, including opening and closing doors.
Effective Sidewalk Width:	The width, in meters, of a walkway usable by pedestrians, or the total walkway width minus the width of unusable buffer zones along the curb and building line.
Geometry:	The spatial characteristics of a facility, including approach grade, the number and width of lanes, lane use, and parking lanes.
Green Time:	The duration, in seconds, of the green indication for a given movement at a signalized intersection.
Headway:	The interval between scheduled transit trips moving in the same direction.
Layover Time:	Time built into a schedule between arrival at the end of a route and the departure for the return trip, used for the recovery of delays and preparation for the return trip
Layover Space:	A location at the start or end of a transit route where vehicles are stored temporarily prior to departure.
Level of Service (LOS):	A measure of the quality and quantity of transportation service provided. For roadways, a quantifiable measure of congestion as determined by the volume to capacity ratio and expressed by a series of letter grades from A (low volume to capacity ratio) through E (high volume to capacity ratio) and F (gridlock; volume exceeds capacity).
Low Floor Bus:	A bus without steps at its entrances and exits.
Midblock:	A location between two intersections.
Mode:	A particular means of travel, such as bus, auto, or walking.
Model:	An analytical tool (often mathematical) used by transportation planners to assist in making forecasts of land use, economic activity, travel activity and their effects on the quality of resources such as land, air and water.

Multimodal:	Refers to the availability of multiple transportation options, especially within a system or corridor. A concept embraced in ISTEA, a multimodal approach to transportation planning focuses on the most efficient way of getting people or goods from place to place, be it by truck, train, bicycle, automobile, airplane, bus, boat, foot or even a computer modem.
Off-Peak Period:	Non-rush periods of the day when travel activity is generally lower and less transit service is scheduled. Also called "base period".
Offset:	The difference, in seconds, between the start of green time at the two signalized intersections of a diamond interchange for through traffic on the internal link or the time between the start of individual green times and a specified time datum in a system of signalized intersections.
Origin:	The point at which a trip begins.
Parking Duration:	The length of time a vehicle remains in one parking space.
Parking Turnover:	The number of different vehicles parked at a specific parking space or facility during the study period. Parking turnover measures utilization.
Peak:	The time period (often an hour) during which the maximum amount of travel occurs. It may be specified as the morning, afternoon or evening peak.
Pedestrian Signal Head:	Component of traffic signal that displays walk / don't walk indications for pedestrians.
Pedestrian Queuing Area:	Places such as elevators, transit platforms, and street crossings in which pedestrians stand temporarily while waiting to be served.
Pedestrian Mobility:	The ability for pedestrians to maneuver and move easily.
Phase:	When referring to traffic signals, phase describes the part of a cycle allocated to any combination of vehicle or pedestrian movements which receive the right of way simultaneously.
Queue:	A line of waiting people or vehicles, for example, traffic at a signal.
Queue Jump:	A short section of exclusive or preferential lane that enables specified vehicles (often buses or carpools) to bypass an automobile queue or a congested section of traffic. A queue jump

is often used at signal-controlled freeway on-ramps in congested urban areas to allow preference for high-occupancy vehicles.

Ridership:	The number of rides taken by people using a public transportation system in a given time period.
Roadway Geometry:	The spatial characteristics of a facility, including approach grade, the number and width of lanes, lane use, and parking lanes.
Running Time:	When referring to transit, running time describes the time necessary to traverse a route, including time spent at stops, at signals, and in traffic.
Scramble Intersection:	A signal that permits an exclusive pedestrian phase at an intersection where pedestrians are allowed to cross in any direction including diagonally within the limits of the crosswalk lines.
Service Frequency:	The number of transit units (vehicles or trains) on a given route or line, moving in the same direction, that pass a given point within a specified interval of time, usually 1 h; see also Headway.
Signal Timing:	When referring to traffic signals, timing describes the amount of time allocated to each interval within each signal phase. For example, 25 seconds might be allocated to the green interval, followed by a four second yellow interval and a four second all-red interval, before the next phase begins.
Signal Delay:	The additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures at an intersection.
Signal Priority:	An automatic or manual device for altering the normal signal phasing or the sequence of a traffic signal to provide preferential treatment for specific types of vehicles, such as buses or trains.
Signal Phase:	When referring to traffic signals, phase describes the part of a cycle allocated to any combination of vehicle or pedestrian movements which receive the right of way simultaneously.
Street Furniture:	Fixtures along a roadway such as benches, planters, landscaping, trees special paving and lighting fixtures. Coordinated street furniture can be used to create a specifically desired atmosphere or appearance.
Striping:	Markings on a roadway that delineate the location of lanes and other traffic indicators, such as turn arrows.

Thermal Plastic:	Type of coating used for adhering striping or colored indications to pavement, which is more durable than paint.
Traffic Delay:	The component of delay that results when the interaction of vehicles causes drivers to reduce speed below the free-flow speed.
Travel Time:	The average time spent by vehicles traversing a roadway segment, including control delay, in seconds per vehicle or minutes per vehicle.
Trolley Coach / Bus:	An electric, rubber-tired transit vehicle, manually steered, propelled by a motor drawing current through overhead wires from a central power source not on board the vehicle. Also known as "trolley coach" or "trackless trolley".
Turning Radii:	The radius of the circle that is traveled by the design vehicle when completing a turn.
Zebra-Striped Crosswalk:	A crosswalk painted with diagonal stripes.